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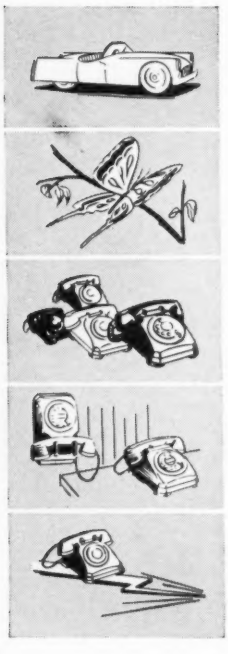

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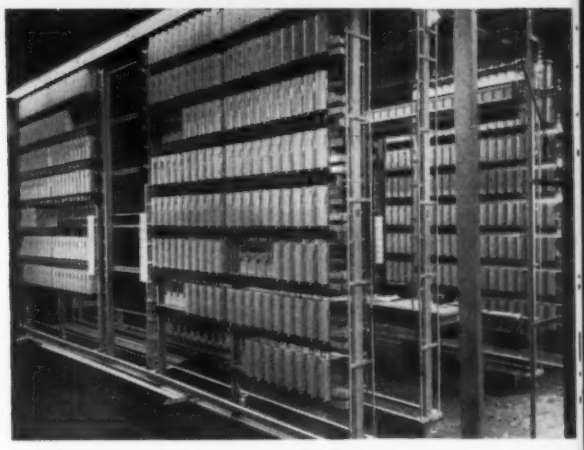

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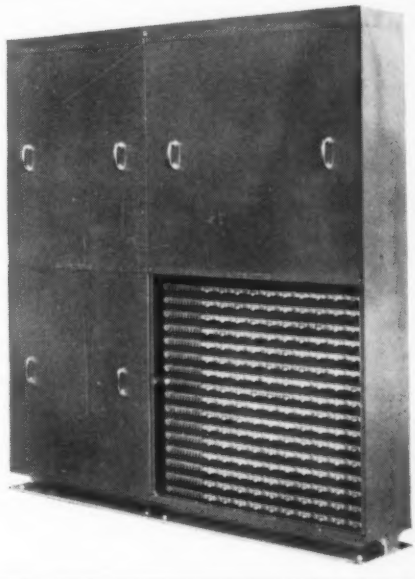

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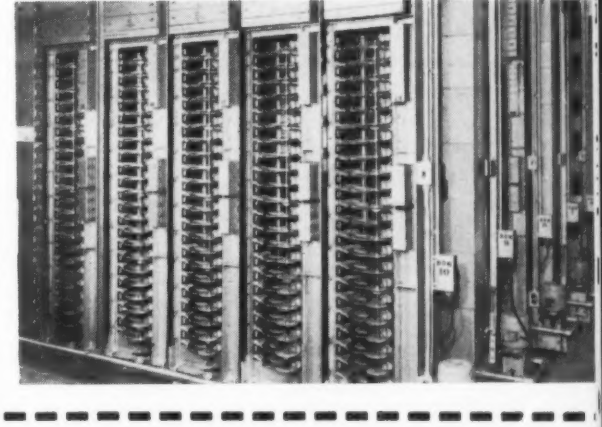

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FLASHES AND PLUGS

REMINISCENCE. Howard R. Wolle, REA field representative, operations and loans division, covering Montana, sent TELEPHONY the following item from a Belmond, Iowa, paper, which recalls events of 50 years ago. He said the news note stirred his memories because he worked for the Belmond Telephone Co. from 1916 to 1919. The item:

"Western Electric Telephone System advertises: 'If there are eight or 10 farmers in any locality tributary to Belmond who would like to build, own and operate a rural telephone line at the expense not to exceed $35 per subscriber and a terminal fee of 17 cents per month for central office connection, write our Mason City office.' "

Mr. Wolle commented, "I cannot remember the low fee of 17 cents per month for a central office connection, now called a switching fee, but remember well the 25 cents a month rate and the roar put up when this rate was raised to 35 cents monthly.

"I also remember the extra loud cry raised when an extra charge was asked for when a call was made by a switched-line subscriber from a country home to another town or trade center. This trouble was eliminated by giving a special monthly rate to subscribers desiring this privilege."

Mr. Wolle also recollected, "The policy then as now was to hold the number of stations down to eight or 10 per line. But friendship, also relationship, soon ran this number to double or triple the stations per line."

•

BOTANICAL BOON. A new kind of plant, discovered down in Venezuela, is being cultivated at the botanical gardens of the Venezuelan National University at Caracas. It looks a lot like sugar cane and when chewed strikes the chewer dumb for at least 48 hours. Apparently the plant has some paralyzing effect on the vocal apparatus.

Just what use can be made of this botanical marvel the Venezuelan scientists do not say, but we suspect some talk-weary husbands could suggest one.

Or maybe it has application somewhere along the party line.

•

PEARL OF PRICE. Back in 1909 Sarah Bernhardt was disciplined by the French government. Accustomed to speaking her mind freely, the actress, carried away by her own emotional ability, once told an uncivil telephone operator just what she thought of the service.

"Now," she said plaintively, "they have taken the telephone away from me. I feel like a woman with one arm. I used the telephone a hundred times a day, and because I lost my temper I have lost the principal convenience of my life."

CIRCULATION

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Since 1901

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Idaho commission refuses to act on petition of electric co-ops to stop commercial power company from serving area in which co-ops are located. . . . Commission ruled it has no jurisdiction over co-ops. Telephone counsel discusses regulation in address before Public Utility Law section of ABA.

AS A GOOD MANY readers are aware, cooperative utility enterprises are subject to regular state commission regulation in only about a dozen states. The law is so indefinite in some states that it is difficult to be more definite than that. But it is safe to say that in the great majority of states—about three-fourths of them—the co-op services are not "public utilities" in the sense that they are subject to rate fixing and other regulations by the state commission.

In past years, REA co-ops and their national association spokesmen have felt that this was a pretty good thing. They always felt that regulation by state public service commissions would tend to hamper or restrict their operations and that REA controls, exercised via their lending obligation, was a sufficient protection for their membership customers and the public interest at large.

But this idea of being free of regulation can work two ways. It has its disadvantages as well as its advantages because public utilities have rights as well as responsibility under commission regulation. And that can be right where co-ops deal themselves a bad card—by going all out for exemption from the ordinary utility responsibility which the commercial companies must accept under commission supervision.

Telephone companies will doubtless be interested in just such a situation as it developed before the Idaho Public Utilities Commission in a recent case involving four REA rural electric co-ops. It seems that these four co-ops had staked out service areas in Idaho and were operating as area monopolies. But, it turned out that some of the farmers or other folks in that area preferred to take their service from the large commercial utility company also operating in that general area. These folks asked the utility company for service and they got it. The co-ops hollered "piracy" and filed complaints with the Idaho commission.

The commission said it lacked authority to handle the case because the complaining companies "are not public utilities . . . and are specifically exempt from the jurisdiction of this commission." The co-ops had charged Washington Water Power Co. (of Spokane, Wash.) was acting as a public utility and selling electrical energy without legal authority in the Clearwater area of Idaho.

Commenting on the decision, Kinsey M. Robinson, president of the utility company, said:

"The Washington Water Power Co. is a regulated public utility and has filed with the state commission certain rules and regulations under which it must operate. If a citizen living in an area served by the company, or adjacent to it, applied to the company for service as provided in its rules and regulations, the company has in the past and will continue in the future to fulfill its obligation to the public."

The complaining co-ops were Clearwater Power Co., Idaho County Light & Power Co-operative Association, Northern Lights, Inc., and Kootenai Rural Electrification Association, all organized through rural electrification loans from the federal government in the 1930's.

"The complainants are not 'public utilities' as contemplated by the statute," the commission said. The commission's opinion stated that it "lacked authority and jurisdiction to entertain the complaint." The cooperatives charged that the Spokane utility, for the last several years, and particularly the last several months, "has been encroaching, aggrandizing and pirating into areas served by your petitioners."

They said that the commercial company has been picking up customers in the more heavily populated areas. They asked for an order which would have restored their former customers to them and forced removal of Washington Water Power lines and poles from their areas. This decision, unless reversed, would doubtless apply to REA telephone cooperatives as well as rural electric cooperatives.

A somewhat contrary situation, involving an REA telephone cooperative, seeking to operate in a regular commercial telephone company's service area, was passed on by the Kentucky commission last year and affirmed by the Kentucky Supreme Court. In that case (H-F-C Rural Telephone Co-operative Corp. v. Kentucky Public Service Commission, decided June 24, 1954, 269 SW2d231), a claim of the telephone co-op for increased operating service area authority was denied.

The co-op operated in the rural area surrounding a city and contended that, in order to operate successfully, it should be granted the right to furnish service within that city instead of allowing service by the existing telephone company. The Kentucky court affirmed the commission's decision rejecting the co-op's argument. In this case, however, the Kentucky commission apparently had jurisdiction over the attempted operations of the cooperative.

Pending FCC Cases

Walter E. Craig, counsel for the Mountain States Telephone & Telegraph Co., gave the recent Philadelphia meeting of the Section of Public Utility

Law of the American Bar Association some interesting side lights on telephone company decisions during the past year. Among others, which have been noted from time to time in this department, Mr. Craig had this to say about some cases now pending on the FCC docket:

"Another step in the eight-year-old Three Circuits Case was taken recently. The commission released a decision on June 30, 1955, in which it reviewed the advantages that it found had resulted from competition in the international common carrier field and granted applications for competing service. Their commissioners dissented strenuously.

"The commission has pending Docket No. 11164 in which it is considering a proposed change in its rules governing the granting of licenses for private relay systems for the transmission of intercity television programs. The present rules permit private systems only on an interim basis until common carrier (telephone company) facilities are available. The proposed rule would permit the granting of licenses for such private relays upon a consideration of the relative cost of the private system and that of the common carrier even if common carrier facilities are available.

"The communications utilities are following the progress of this case closely. These are some of the questions that are being asked. Will the commission discard a traditional test —wasteful duplication of facilities—as a determinant of whether common carriers should provide service? If the rules are changed, will the result be such a multiple division of responsibility throughout the nation-wide network system that both the quality of service and effective regulation by the commission will be impaired? Finally, will the private relays be limited to remote areas for the purpose of expanding TV service or will private operators be permitted to skim the cream, leaving the less remunerative operations for the utilities?"

The television field has produced another interesting situation. The status of community antenna TV systems has had an intriguing, if short, history. The Wyoming Public Service Commission, on November 29, 1954, granted a certificate of convenience and necessity for such a service. The commission reviewed conflicting opinions from other jurisdictions in relation to the status of such a company as a public utility engaged in intrastate and interstate business. The FCC has indicated that it also is considering these problems.

Inflation—Long and Short Range

Mr. Craig told the Philadelphia meeting of utility lawyers that the most striking developments during the past year in the communications field stem from inflationary conditions. Perhaps it would be more accurate to say that the most striking developments arise from both the absence and presence of inflation.

Referring to this "paradox" of inflation being both absent and present at the same time, Mr. Craig said:

"The explanation for this paradox is simply that inflationary forces were quiescent during most of the past 12 months but had been rampant for at least the past decade. To demonstrate, we might look at the Consumers Price Index. In June, 10 years ago, it stood at 77. In June of last year it was 115, an upward change of about 50 per cent. But in June, this year, it stood at 114.4. In the past year the barely perceptible change was downward, although recent indications are that it may start upward again."

What then occurred in the communications field in part, at least, because of the absence of new inflation in the past year? A significant development was the comparative falling off in the number of new requests by utilities for increased earnings. This has resulted in a marked reduction in the number of rate increase requests as compared with the average during the postwar period. But Mr. Craig still feels that the telephone industry has plenty of rate cases ahead of it. He stated on this point:

"Whether this short-term stability will continue in the future and thus act as a damper on the flow of requests for rate increases is better answered by an economist than by a lawyer. Economists indicate that, over the long-pull, continued inflation can be expected. On that basis, we can probably expect a fresh impetus toward requests for rate increases. Even without continued inflation, we can expect continued requests for rate increases for various reasons. One reason is the lag by some commissions in giving recognition to the past decade's inflation when fixing rates. Another is the fact that installation of units of plant at today's high cost inevitably increases the investment on which a return must be allowed."

Mr. Craig noted a number of postwar court decisions which have required regulatory authorities to take into account inflationary conditions. But, he also noted the time lag of these decisions as follows:

"Thus, we have the relatively odd coincidence of courts' taking this action at the same time that the economy levels off. We would not be entirely accurate if we did not mention that there has been a contributing cause to this phenomena other than the accrued inflation of the past decade. It seems quite apparent that the judicial lag is partly responsible for the coincidence. No reflection on the courts is intended —such a lag is inherent in our judicial process. Adjudications must necessarily come after the facts are established."

Smoot's Law

One of the factors which must always be considered in any long-range contemplation of price trends is what Washington observers sometimes refer to, a little cynically perhaps, as "Smoot's Law." This name goes back to a famous St. Patrick's Day speech in the Senate over 30 years ago (1925 to be exact) by the late Sen. Reed Smoot (R., Utah). "Smoot's Law" simply means that the cost of government operations (to the taxpayer) always tends to go up and up, *no matter which party is in power.*

Senator Smoot was as persistent a watchdog of the Treasury, in his day, as Senator Byrd (D., Va.) is in ours. But he found himself forced into the position of defending an administration budget against opposition attacks that it was wasteful. Said the Utah senator:

"There has never been a year since that time (the year of the billion dollar Congress) when the cost of government has not increased and it will continue to increase, I care not what party is in power."

Editors of that day were charmed by this frank statement by a politician of a thesis long suspected to be inexorable. They dubbed it "Smoot's Law" and it has continued to operate ever since as an inflationary influence in good times and bad, and in war and in peace. Government always spends more and more and the taxpayers have never been able to catch up with it.

The Anti-solicitation Problem

A Portland, Ore., ordinance banning telephone solicitation of business was repealed on the eve of its effective date, Sept. 2, and has probably been killed. The sweeping anti-telephone-solicitation ordinance, which forbade the making of uninvited telephone calls to prospective customers for the purpose of selling merchandise or a service, was passed earlier this year.

"The council did not intend originally to restrict legitimate businesses but only to stop outsiders who come to town with a quick telephone campaign to take out money without leaving anything," explains Ormond R. Bean, finance commissioner (and former Oregon utility commissioner) who was named to look into the problem after the uproar that followed approval of the ordinance. "Innumerable calls" were also received in support of the measure by people "sick of telephone soliciting," he said. "We have not yet discovered a way to stop the rackets without stopping legitimate business, but we hope to gain our goal by strict enforcement of existing business license requirements."

The telephone company's position in a controversy of this kind can be difficult, if not embarrassing. Every telephone company with substantial city area operations has run into complaints, at one time or another, about

(Please turn to page 42)

REA Makes Seven Telephone Loans Amounting to $3,455,000

Seven loans amounting to $3,455,000 were made by the Rural Electrification Administration during the week of Aug. 28-Sept. 3, to improve and extend telephone service in rural areas, the U. S. Department of Agriculture announced on Sept. 8. Details of the loans for use in Tennessee, Indiana, Georgia, Iowa and Maine follow. The loan to the Commerce Telephone Co. in Georgia was the largest REA telephone loan made in that state to date.

Ardmore (Tenn.) Telephone Company, Inc. on Aug. 29 was allocated a $327,000 loan. The borrower plans a modern automatic system to serve 942 rural subscribers in Limestone and Madison counties in Alabama, and Giles and Lincoln counties in Tennessee.

The company is now providing magneto service to 230 subscribers over 31 miles of line. This includes 17 farm families owning their own lines. Of the existing mileage, 20 miles will be used in the expanded system and 11 miles rebuilt. The company plans to add 113 miles of new line.

A new commercial and central office building will be constructed at Ardmore to serve the area. The rehabilitation and new construction possible under the REA loan will result in improved service to the existing subscribers and initial service for 712 rural families in the two states now without service.

In May, 1951, REA allocated $127,000 to Ardmore. This was later rescinded. The Aug. 29 loan, therefore, is the first actual loan made to the company.

F. C. Merrell is president and manager of the Ardmore company.

*

The Eureka Telephone Co., Corydon, Ind., was awarded on Aug. 29 an allocation of $118,000, fourth loan to this borrower.

The Eureka company proposes to expand its service in Harrison County. It plans to acquire the facilities of the Farmers Metropolitan Telephone Co. at Palmyra, Ind., now providing magneto service to 200 subscribers over 38 miles of line. About 33 miles of the existing line will continue in use and 5 miles will be rebuilt for the expanded system.

The borrower plans to add 31 miles of new line and convert the Palmyra exchange to automatic operation. The proposed changes will enable the borrower to furnish improved service to the existing 200 subscribers and to serve 268 rural families now without telephones.

The four REA loans to the company, totaling $1,539,000, will make possible new and improved service to 3,884 subscribers in Crawford and Harrison counties through eight exchanges. The Corydon, Laconia, Mauckport, New Middleton, Ramsey and Valley City exchanges are in operation and provide dial service to about 2,500 subscribers.

The borrower also plans to convert the Milltown exchange to automatic operation. Palmyra, provided for in the Aug. 29 loan, will be the eighth exchange. The completed system will consist of 738 miles of line.

Dr. William E. Amy is president and Claude A. Davis is acting manager of the Eureka Telephone Co.

*

Commerce (Ga.) Telephone Co., on Aug. 30 secured allocation of $1,560,000, its first REA loan, to finance the improvement and extension of rural telephone service in Banks, Franklin, Jackson and Madison counties. It is the largest telephone loan made by REA in Georgia to date.

The Commerce company is planning a modern telephone system to serve 3,722 subscribers in northeast Georgia. At present the borrower is serving 1,769 subscribers over 297 miles of line.

About 260 miles of the existing line will be used in the expanded system; 19 miles will be retired and 18 miles rebuilt. In addition the company will add 398 miles of new line. The present automatic facilities at Commerce, Homer and Maysville will be improved and expanded, and the magneto and common battery equipment at Braselton and Jefferson replaced with new automatic facilities. The borrower now plans service without toll charge among some of its exchange areas.

A new building to be constructed at Jefferson will house central office, commercial and toll center facilities. Toll traffic for the proposed system will be handled through the Jefferson central office over toll facilities owned and operated by the borrower. These toll lines, located in Barrow, Hall and Clarke counties, will connect with toll centers of Southern Bell Telephone & Telegraph Co. and Georgia Continental Telephone Co. The loan funds will also be used for refinancing existing indebtedness of the borrower.

W. L. New is president and manager of the Commerce company.

*

Farmers Mutual Cooperative Telephone Co. of Shelby County, Harlan, Iowa, on Aug. 30 gained an allocation of $287,000, second loan to this borrower.

Farmers Mutual Cooperative plans to use these funds, together with the first loan of $295,000 made in August, 1954, to furnish modern dial service to 1,270 rural subscribers in Shelby County.

Since the first loan was made, the borrower and the United Telephone Co. of Missouri have negotiated a sales agreement whereby the borrower will sell its facilities in the town of Harlan to the United company. At the same time, the borrower will purchase from United rural telephone properties outside of the town of Harlan.

Under the revised system design, Farmers Mutual cooperative proposes to construct a new automatic central office office outside of Harlan to serve the newly acquired territory.

The completed system, consisting of 205 miles of line, will operate from three automatic central offices located at Irwin, Kirkman, Jacksonville and the one near Harlan provided in the second loan.

Dean Jorgensen is president of the Farmers Mutual cooperative.

*

Union (Me.) Telephone Co. on Aug. 31 got approval of a loan of $139,000, first loan to finance the improvement and extension of rural telephone service in Knox County.

The company is now furnishing magneto service to 354 subscribers over 73 miles of line. With the funds made available in the REA loan, the borrower proposes to convert its system to automatic operation and add facilities to serve 53 additional rural families now without telephones.

(Please turn to page 42)

The author standing atop of his 40-foot magnesium extension ladder, which weighs only 57 pounds.

LADDERS—

Use in the Telephone Industry

By RAY BLAIN

A LADDER, as defined by the National Safety Council, is an appliance usually consisting of two side rails, joined at regular intervals by cross-pieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

There are 12 types of ladders in use, classified as stepladders, single ladders, extension ladders, sectional ladders, trestle ladders, extension trestle ladders, special purpose ladders, trolley ladders, side-rolling ladders, fire ladders, fixed ladders, and portable ladders. The most commonly used ladders in the communications industry are the stepladder, single ladder, extension ladder and trolley ladder. These ladders are defined as follows by the American Standards Association:

(1) *Stepladder.* A stepladder is a self-supporting portable ladder, non-adjustable in length, having flat steps and a hinged back. Its size is designated by the over-all length of the ladder measured along the front edge of the side rails.

(2) *Single Ladder.* A single ladder is a non-self-supporting portable ladder, non-adjustable in length, consisting of but one section. Its size is designated by the over-all length of the side rail.

(3) *Extension Ladder.* An extension ladder is a non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets so arranged as to permit length adjustment. Its size is designated by the sum of the lengths of the sections measured along the side rails.

(4) *Trolley Ladder.* A trolley ladder is a semi-fixed ladder, non-adjustable in length, supported by attachments to an overhead track, the plane of the ladder being at right angles to the plane of motion.

Stepladders and single ladders are used frequently by station installers. These men also use extension ladders occasionally, but, in general, they are more frequently used on construction and for cable splicing. Trolley ladders are used almost exclusively in equipment rooms in connection with the maintenance of equipment bays and main distributing frames.

We are advised by the National Safety Council that most portable ladders are made of wood, and the species and quality of wood used, of course, have an important bearing on the strength of the ladder. All wood used for ladder construction should be straight-grained, thoroughly seasoned, free from large checks, shakes, or injurious knots. The wood may have knots of certain sizes, however, under special conditions as provided in the Wood Ladder Code.

Ladders may have either parallel or spreading straight sides unless otherwise specified. The sides of portable ladders may also flare at the base to increase the ladder's stability, and may converge at the top where specific uses warrant.

On ladders more than 4 feet long, the inside width between side rails should be not more than 32 inches, except for flared bases, and not less than 10 inches, except where rails converge at the top. In the latter case, this minimum width should apply at a point not more than 4 feet from the top. On ladders less than 4 feet long, the minimum width between side rails should be 8 inches.

Extension ladders up to 36 feet require a minimum overlap of 3 feet. A 4-foot overlap is required for longer extension ladders. For example, a 40-foot extension ladder (two 20-foot sections) can be extended to only 36 feet.

To prevent the spreading of side rails and to keep a tight fit on rungs, some companies provide tie rods, placed just beneath the rungs and not over 10 feet apart. Tie rods should pass through both side rails and, with a washer, should be riveted at each end. Riveted ends should be countersunk to give side rails a smooth surface. The dimensions of the side rails are determined by the length of the ladder. Wood side rails should be dressed on all sides and should be free from sharp edges and splinters.

The six different kinds of wood used as material for side rails are Sitka

Spruce, Noble Fir, Western Hemlock, Douglas Fir, Longleaf Pine and Norway Pine. In recent years, Sitka Spruce has been difficult to obtain and consequently Fir has come to be the most widely used wood.

In the making of rungs for wooden ladders, the most desirable is Hickory. Others are White Ash, Pecan, White Oak, and Maple.

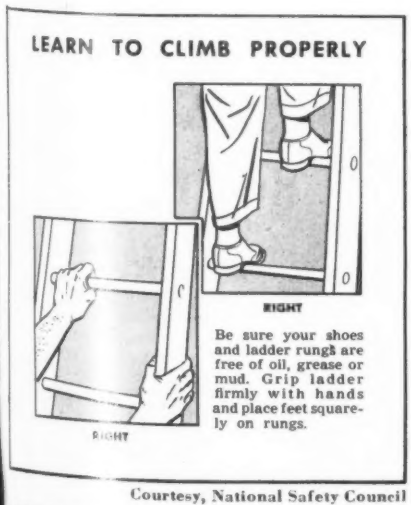
Other materials used to make ladders include iron, steel, magnesium, and aluminum. Aluminum and magnesium ladders are much lighter than those constructed of wood or steel.

Aluminum ladders were first used for fire fighting, and while the start was slow, the increase was steady so that today most fire ladders are constructed from this material. Conversion by industry from wooden ladders to aluminum or magnesium has followed a similar pattern.

Telephone operating companies are well aware of the greater cost of aluminum ladders. They are likewise aware of the electrical hazard they present as they are good conductors of electricity. Generally speaking, however, when we compare the accident rate of wood and metal ladders, and consider the number of each type in use, volume for volume, the percentage of accidents with metal ladders is less, even when we make allowance for electrical hazards. We are all familiar with the fact that any work around electricity is always hazardous, regardless of the equipment used, but it is believed that with proper precautions, the electrical hazards of metal ladders can be minimized.

The facts for superior rating of the aluminum and magnesium ladders are obvious. These ladders are considerably lighter in weight than wood. An aluminum channel rail is approximately two to three times stronger than a similar section of wood. Obvious to telephone users also is the longer life resulting from the fact that aluminum does not deteriorate with age or moisture conditions. Aluminum ladders, because of greater resiliency, will give sufficient warning before breaking, whereas with wooden ladders, the bending and breaking point is often almost simultaneous.

What You Should Know About
LADDERS
for Service and Safety . . .
A ladder's purpose is so obvious that few people bother to learn safe methods for climbing and use of this simple tool. Selecting the right ladder for the job means using a ladder of proper length. It is important to first ascertain the vertical height from ground level to the point where ladder is to rest against the building. By referring to chart on right, the correct length of ladder for any specific height can be determined.
VERTICAL HEIGHT
¼ VERTICAL HEIGHT
Add any distance that extends above point of contact or below ground level.
If Vertical Height Is — Minimum Working Length
12 ft. ..... 16 ft.
14 ft. ..... 18 ft.
16 ft. ..... 20 ft.
20 ft. ..... 24 ft.
24 ft. ..... 28 ft.
28 ft. ..... 32 ft.
32 ft. ..... 36 ft.
34 ft. ..... 40 ft.
38 ft. ..... 44 ft.
44 ft. ..... 50 ft.
For heights of 50' and over, three-section ladders are required. Most ladders over 38 ft. working height also made in 3-sections.
Chart takes into consideration the lap required for extension ladders.
HOW TO ERECT A LADDER CORRECTLY
Extension or Single
Raising and lowering long length ladders is a two man job.
Brace lower end against base of wall or step so it cannot slide.
Raise top end and walk forward under ladder as shown.
When erect, reach thru —lift off ground and carry erect.
Ladder should be placed so that space between bottom of the ladder & house is one-fourth length of ladder.
RIGHT
Showing ladder at proper use angle.
WRONG
Angle too great. Ladder may break.
WRONG
Base too near house. Ladder might tip.
Courtesy, National Safety Council


LEARN TO CLIMB PROPERLY
RIGHT
Be sure your shoes and ladder rungs are free of oil, grease or mud. Grip ladder firmly with hands and place feet squarely on rungs.
RIGHT
Courtesy, National Safety Council

The question is frequently asked, "Why not insulate metal ladders from the ground so that they will not be an electrical hazard?" There has been some action taken in the past to insulate metal ladders, but from what we can learn, it has not proved very successful. One attempt was made to insulate the feet and another to insulate a section of the ladder. Still another attempt was made to insulate the rungs. There is also a record of a case in which the insulation on the feet was damaged and grounded the ladder. There is yet another case on record wherein a supposedly insulated metal ladder was being used by a man standing on the ground with one foot on the lower rung, while holding the metal side rails. This position completed the circuit as the insulation was by-passed to ground. As a result of these inherent failures, the National Safety Council has discouraged all attempts to insulate metal ladders.

The Public Utilities Section of the National Safety Council makes the following statement concerning the use of metal ladders: "Because of the light weight and apparent strength of aluminum and other metal ladders, they are now being used in industry and by the population at large. This use creates new safety problems. Inasmuch as methods of manufacture and use have not yet been standardized, it is important that possible hazards and necessary safety measures be brought to the attention of users of such ladders. Standardization of construction and use, along such lines as may be

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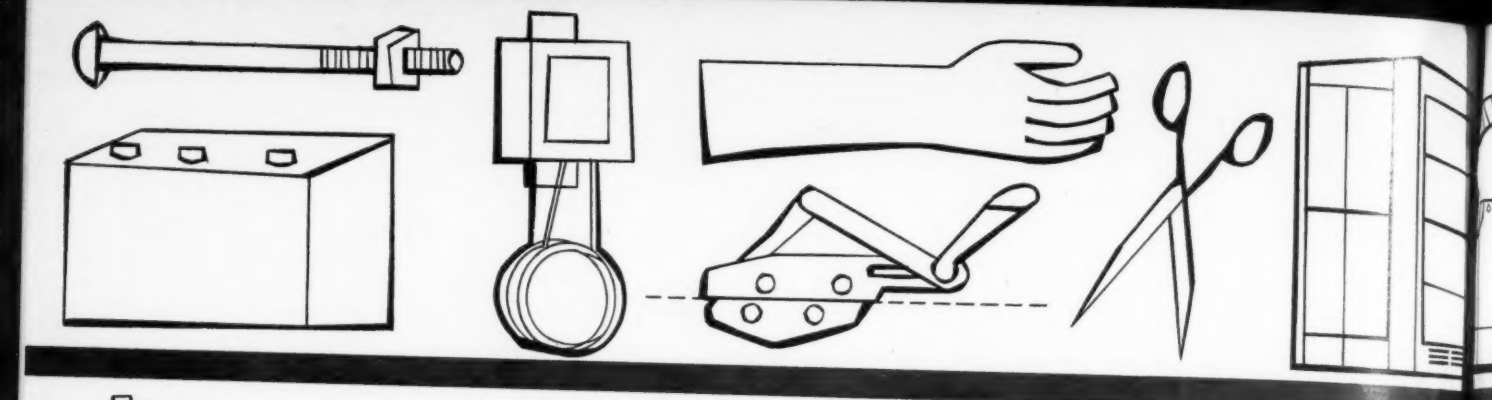
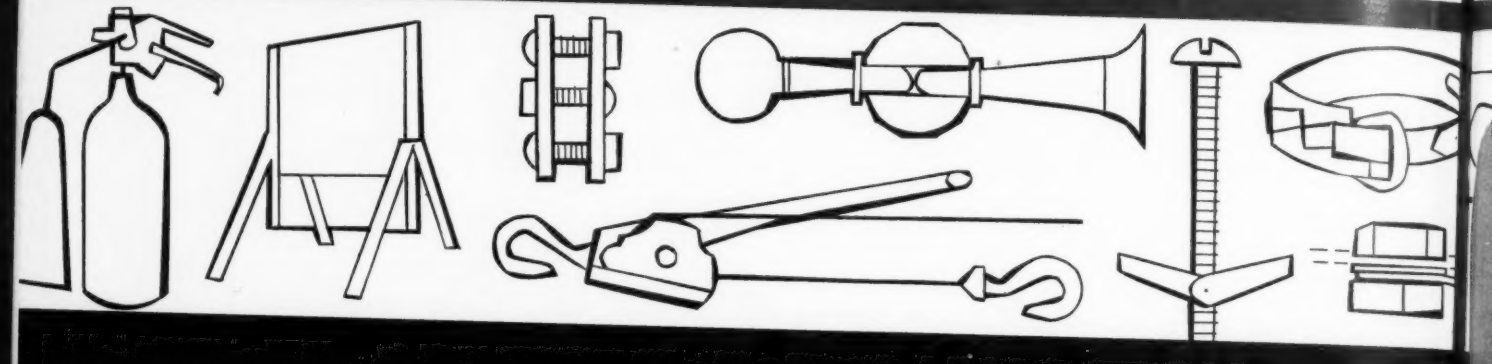
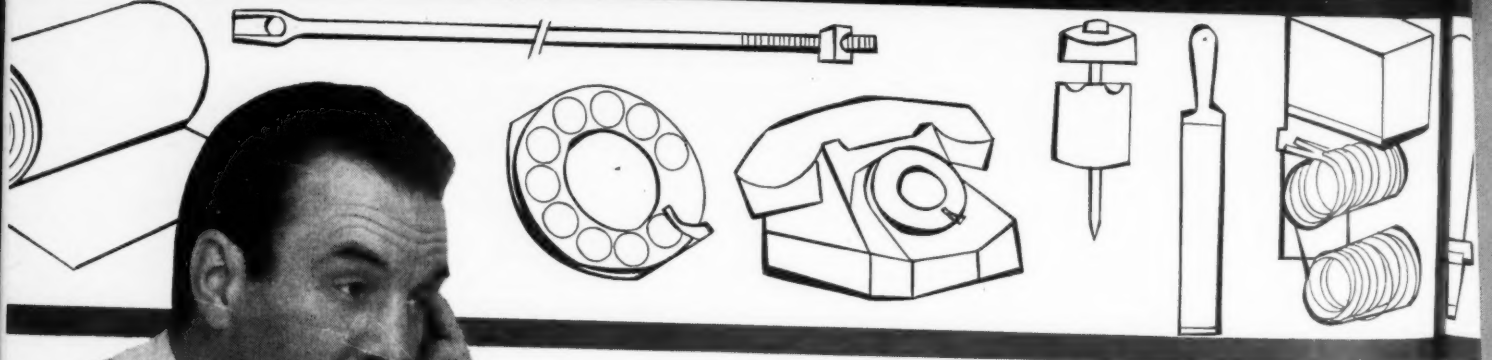




AUTOMATIC ELECTRIC



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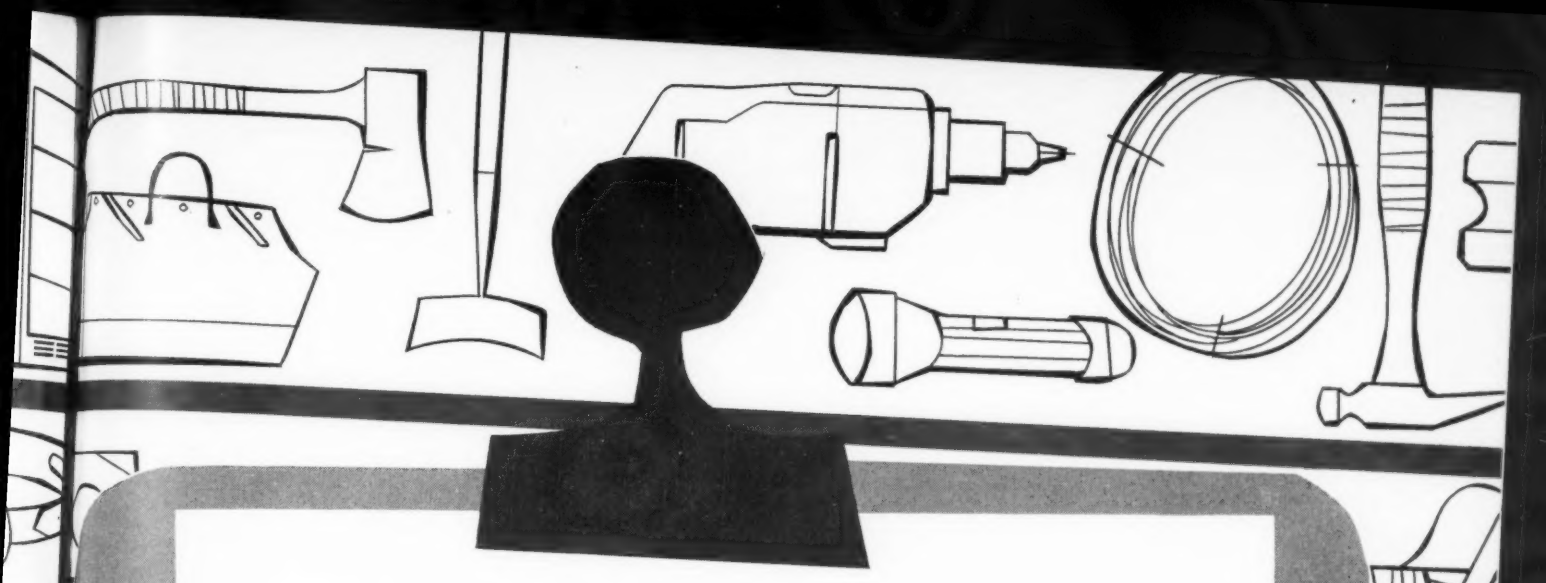

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indicated by future studies and analysis, should be effected as soon as possible.

"No reflection upon the integrity or objectives of the manufacturers of light metal ladders is intended. Such ladders have a definite place in work procedures and in general use. Their safe use is important to all.

"All metal ladders are electrical conductors. Their use around electrical circuits of any type or in places where they may come in contact with such circuits is not recommended. The electrical hazards of metal ladders need to be given special attention because the ladders which they have supplanted are not conductors. The importance of the electrical hazards involved cannot be overemphasized.

"The following are illustrative of the types of structural and other hazards noted:

"(1) Channel-shaped side rails may have sharp edges, sharp enough to cut the hand.

"(2) Treads, in general, appear to be slippery. Some are smooth, some are punched from the underside, providing sharp projections to prevent slipping; others are corrugated. Unless the corrugations are filled with abrasive material, there appears to be no reduction in slipperiness. Rubber treads cemented to the aluminum treads are used in some instances, and rubber or other insulating feet are provided to prevent slipping. Sharp edges and burrs were also found on treads.

"(3) In some instances, heavy loads caused soft rivets to bend, so that a shearing action on the rivets themselves results.

"Concerted and consistent action taken by users will do much to counteract the hazards of metal ladders. A number of suggestions are detailed below. It cannot be hoped that they are all-inclusive; however, their use will no doubt bring to light such other procedures as may be required for particular industries and particular companies.

"(1) Prohibit the use of metal ladders in the vicinity of electrical circuits or in places where they may come in contact with them.

"(2) Mark all metal ladders with signs or decalcomanias reading *'Caution—Do Not Use Around Electrical Equipment'*.

"(3) Request manufacturers and suppliers to mark ladders properly with respect to electrical hazards. Suggest including such information in advertising literature. (This measure will advance the program for the recognition of the hazards of metal ladders.)

"(4) Remove sharp edges and burrs from side rails and treads.

"(5) Select ladders with non-skid treads.

"(6) Examine rivets to make sure that soft aluminum rivets have not been used in fabrication.

"(7) Provide cemented rubber treads, or on slippery treads, abrasive material in tread corrugations.

"(8) Make sure the ladder can carry intended loads without failure.

"(9) Wherever possible, press for the standardization of light metal ladders by manufacturers.

"(10) Make necessary revisions of safety instruction or codes.

"(11) Revise working and job instructions.

"(12) Send bulletins on metal ladders to field forces.

"(13) Provide publicity in company publications.

"(14) Make metal ladders the subject of posters.

"(15) Mention hazards from the standpoint of "off-the-job" use in company releases.

"(16) Present the problem to local community safety organizations."

It is generally recommended that all portable ladders, except stepladders, be equipped with non-slip bases or that the bottoms of the ladders be held, tied, or securely anchored to prevent

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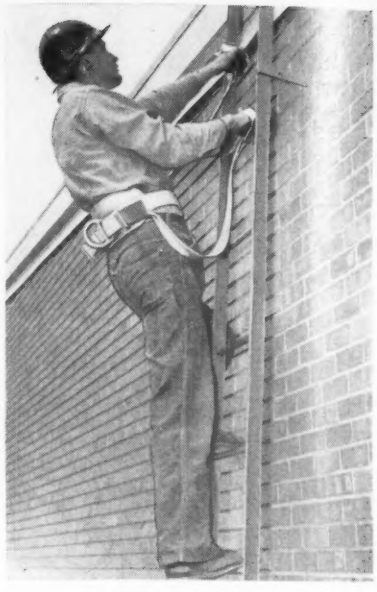
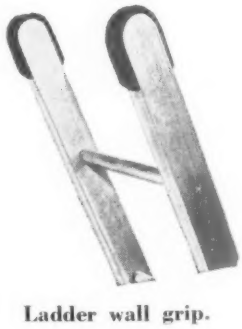
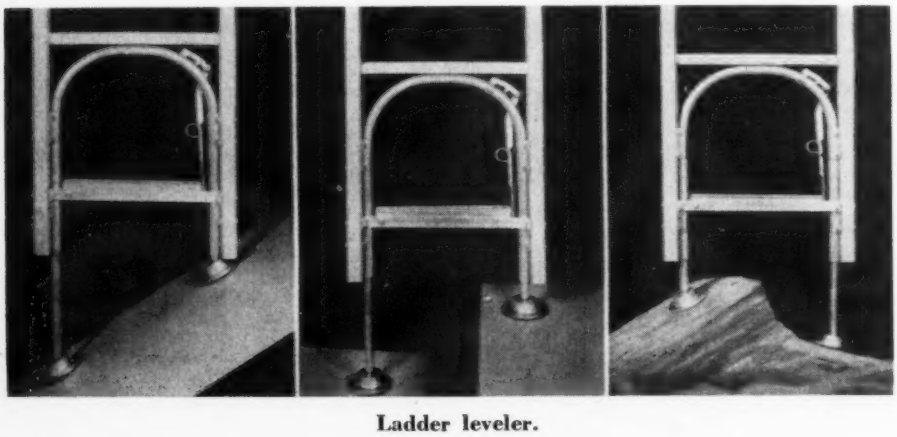


Ladder climber.

Ladder pole grip.



Ladder wall grip.



Ladder leveler.

Ladder shoe.

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITOR

IT IS a well-known fact that in some of our larger cities, private branch exchange telephone service presently represents about 15 per cent of the stations, 25 per cent of the local traffic and 50 per cent of the toll service. To date, it has not been the practice or policy of the operating telephone companies to permit outside telephones to dial PBX extensions. Then, too, in many cases, PBX extensions are not permitted to place toll calls direct, but must file them with the attendant.

If this system is not drastically changed, it will undoubtedly have a serious impact upon the Direct Distance Dialing Plan. It would not appear desirable to dial a PBX number in a distant city, have the call completed when the attendant answers, and then find the extension busy. Neither would it appear desirable to have the attendant dial outgoing toll calls for a large PBX. If the extension dials these toll calls direct, however, they will be recorded against the PBX trunk number. In this case, no control will be had of the outgoing toll calls.

Perhaps there is a solution to this problem now available; but if not, there is little doubt that it will be solved in the not-too-distant future. PBX service is a most important part of our universal telephone plan and it will unquestionably be greatly expanded in the future. There appears to be no good reason why a PBX customer should not have service equal to or even better than a customer on an individual line.

•

The writer recently witnessed a demonstration of a diesel-driven generator set of a new and novel design. This is a 60-kw, 60-cycle, three-phase, 220-volt unit that weighs only 3,800 pounds. It measures 60 inches high, 36 inches wide and is about 60 inches long.

A companion unit, 5 kw capacity, 60-cycle, three-phase, 220-volt, weighs only 485 pounds. This small unit is powered by a gasoline engine.

•

A device known as the Autodialer permits the calling of a maximum of 30 different telephone numbers by merely depressing one of its keys. A pad, comprising a keyboard with up to 30 keys, is placed on the desk near the telephone and a terminal and relay unit.

Each key may be assigned numbers up to eight digits. This permits its use on a PABX station as one unit is used for access to the central office trunks and seven digits to meet the requirements of the standard 2-5 numbering plan. The numbers and names of the subscribers may be printed on the respective keys which in effect is a ready directory.

This dialer will operate in conjunction with any type of dial telephone system and can be used with any standard telephone. The power supply is a part of the wall cabinet and may be arranged to operate on 110 or 220 volt ac.

•

The modern automobile of today makes use of as many as 13 electric motors.

•

Unusual road signs always attract attention and cause passing motorists to do their bidding.

A sign outside a small Japanese village reads: "Please drive carefully. Our children may be disobeying us."

According to *The Leich Line*, a sign outside Prospect Heights, near Chicago, reads: "Danger Live Children."

•

The writer enjoyed a visit recently to the new General Motors school for service men located in northern Virginia, near Washington, D. C.

Class rooms are provided in which small groups of students are trained on the maintenance of the various types of General Motors automobiles. These students learn by doing and actually adjusting and testing the various complicated parts of the modern automobile.

It appears that the automotive industry has now adopted a plan similar to the one that has proved so successful in the training of men in the maintenance of dial switching equipment down through the years.

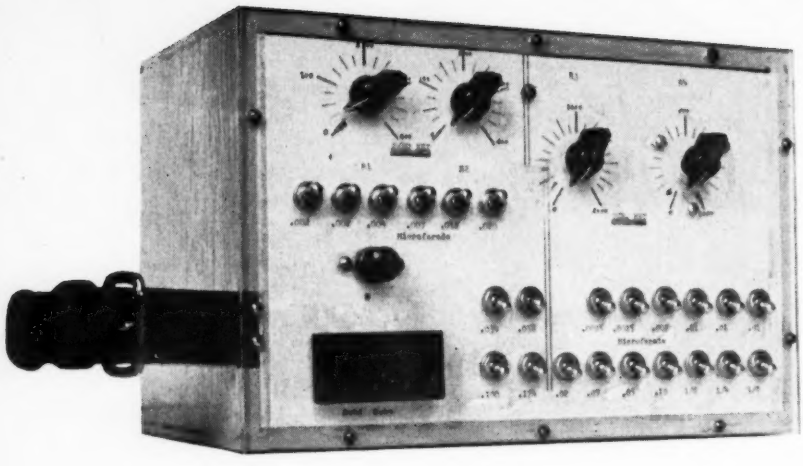
•

In an 80-hour course that introduces him to the rudiments of telephone line work, a rookie lineman spends 16 hours to learn the pole climbing art in the Chesapeake & Potomac Telephone Co.'s plant school in Baltimore, Md. From a safety standpoint, this is considered the most important part of his training.

In the 16-hour climbing course, instructors make an effort to demonstrate as many of the dangers of the job as possible. They show the effects of dull gaffs, of gaffs filed too sharp, and of properly sharpened gaffs. In one or two years, the gaffs of the climbers are worn away by sharpening and must be replaced. The poles on which the rookies practice usually wear away in shreds with every other class and must be replaced.

This is certainly a far cry from the methods used back when "yours truly" learned to climb. We learned the hard way then and got laughed at by all when we burned a pole. It was even considered a disgrace to sharpen the gaffs of climbers. Anyone caught filing gaffs was dubbed a sissy and probably laughed off the gang.

There is no doubt but that "the learn by doing schools" conducted by operating companies have paid big dividends both to the employes and the company by the increasing safety and efficiency of workers.



This home made test box is used for adjusting the network in repeaters. It consists of four potentiometers, and several condensers which may be cut in or out of the circuit by toggle switches. In use, the correct values are determined by experiment on this test box. The resistors and condensers in the actual repeater are then wired up to correspond with the setting on the box.

Voice Frequency Repeaters

Copyright 1955 by Telephony Publishing Corp.

By HAROLD B. McKAY

PART 2—Hybrid Coils

A TELEPHONE repeater must amplify voice currents in both directions. The usual amplifier, however, amplifies in one direction only; so two are necessary. One amplifier works in the west to east direction, and the other works east to west. (Or any other combination of directions.)

In order that the two voices, coming from opposite directions, shall be sent through the proper amplifier without causing singing or feedback, a specially-wound type of transformer known as a hybrid coil is used. *Fig. 2.1* shows a simplified version of this. The coils on each line are hybrid transformers. The triangles represent amplifiers which amplify in the direction to which the tip of the triangle points. The telephone line is, in effect, a single track circuit; but it must handle voice in both directions. The arrows show how the E-W voice is detoured around the W-E voice as they pass in the repeater, each in its separate amplifier.

While this works fine on a railroad, there is an additional problem with voice currents. This problem is that the voice currents in addition to going out on the line, can also "feed back" into the amplifier pointing in the opposite direction.

This is shown by the arrows in *Fig. 2.2*. Notice that the voice travels from the west line to coil 1, coil 2, and coil 4, then to coil 5 and the east line. At this point, because coils 4, 5, and 6 are wound on the same core, the voice, in addition to going from coil 4 to 5, might also go into coil 6. This coil will take it through the east to west amplifier, and back in the direc-

Reprints Will Be Available

This is the first of a series of nine articles—six on "Voice Frequency Repeaters" and three on "Power Supplies for Repeaters and Carriers."

The author, Mr. McKay, will be remembered for his three series of popular articles on "Principles of Microwave Operation"; "Electrical Principles Used in Carrier Systems"; and "Corrosion of Underground Cables" and other articles published in TELEPHONY.

These repeater articles will be invaluable as employe training material and if firm orders are received for a sufficient number of reprints (in booklet form) to justify reprinting, they will be available following publication of the nine articles.

Telephone companies desiring reprints are asked to enter their reprint orders during publication of the articles. Prices of the booklet form of reprint are as follows:

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401- 500 copies	each	.65
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Over 1,000 copies	each	.50

tion from which it came. (Hence the name for it—feed-back.) After being amplified by the E-W amplifier, the voice would enter coil 3, then coil 2, the W-E amplifier and around the same route again.

"*Singing*"

This effect continues and the volume of sound rapidly builds up to a point where nothing but a shrill whistling or siren-like sound is heard on the circuit. This ear-splitting blast was charitably called "singing" by some nameless individual of long ago, who was no doubt thinking of public relations when he thought up this word.

When a repeater "sings," it is the same thing as when the transmitter and receiver of a telephone are placed together. In a repeater, one amplifier might be thought of as the receiving amplifier, and the other as the transmitting amplifier. Hence when the two are hooked together, singing results from the feed-back of sounds. This effect can be avoided in a repeater by the use of an additional winding in the hybrid coil and a balancing network. The network is a combination of resistance, capacitance, and inductance.

Fig. 2.3 shows the actual hook-up of the hybrid coil in a typical two-way repeater. This shows that each of the windings of the hybrid coil is actually a double winding, with a lead brought out at a point which amounts to a center tap. It will also be seen that in this type of circuit, the hybrid coil in each case is really the output transformer for one of the amplifiers. The input coils to the grids of the tubes are separate transformers.

In order to establish a clear picture in mind of how the currents travel in this circuit, it might be well to

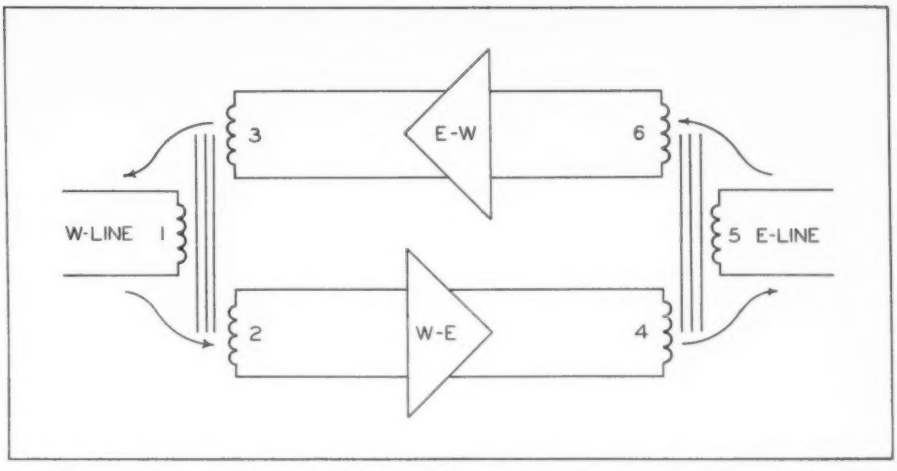

Fig. 2.1. Voices traveling in opposite directions through a repeater pass each other like this. The voice from the west line goes from coil 1 to 2 thence through the W-E amplifier, then from 4 to 5 and out to the listener on the east line. The west voice will also go up into coil 3, but will not go through the E-W amplifier because it is pointing the wrong way. The east voice travels from 5 to 6 to the E-W amplifier, to 3 to 1 and the west line. Other windings in the hybrid transformers have been omitted for simplicity. (All drawings in this article are by Victor Willard.)

trace the input from either side of *Fig. 2.3*. Start with the R conductor at either switchboard, trace through one hybrid coil winding (A), through the input transformer of the amplifier, through hybrid winding (C), and back on the tip of the line. This is the input circuit for each side of the repeater and is a complete ac path for voice currents.

The output of each amplifier may be traced from either wire at the point of the triangle through hybrid coil windings (E) and (F) and back to the amplifier. This output current in (E) and (F) is induced into the other windings of the hybrid, then is transmitted to the receiving switchboard and the network. It will be seen that on each side of the repeater, the network (N) is connected across the hybrid coil on the opposite side from the line. The purpose of this network is to prevent the output currents from one amplifier from feeding back into the input of the other amplifier and thus causing singing, as described above.

To understand how this is accomplished, requires re-drawing the hybrid circuit in a slightly different aspect. *Fig. 2.4* shows the hybrid coil at one end of a repeater. Notice that everything is hooked up in exactly the same manner as in *Fig. 2.3*, but in different proportions.

The network is shown to be a resistance in series with a condenser. In an actual repeater, the network consists of a number of resistances, condensers and coils, which may be connected in different combinations, series and parallel, according to requirements. How this is done will be discussed later. For purposes of studying the hybrid coil, it may be assumed that the coil-condenser-resistor combination has been correctly chosen and is equivalent to an impedance which exactly equals the impedance of the line and switchboard.

If voice currents come out of the upper (W-E) amplifier into coils (E) and (F), these currents will be induced into the other windings in a direction which will cause the currents to circulate as shown by the arrows. If the impedance of the network is exactly the same as the impedance of the line and switchboard, a complete circuit exists; and no current will travel in the input coil of the E-W repeater. This may be understood by remembering that if the net and switchboard

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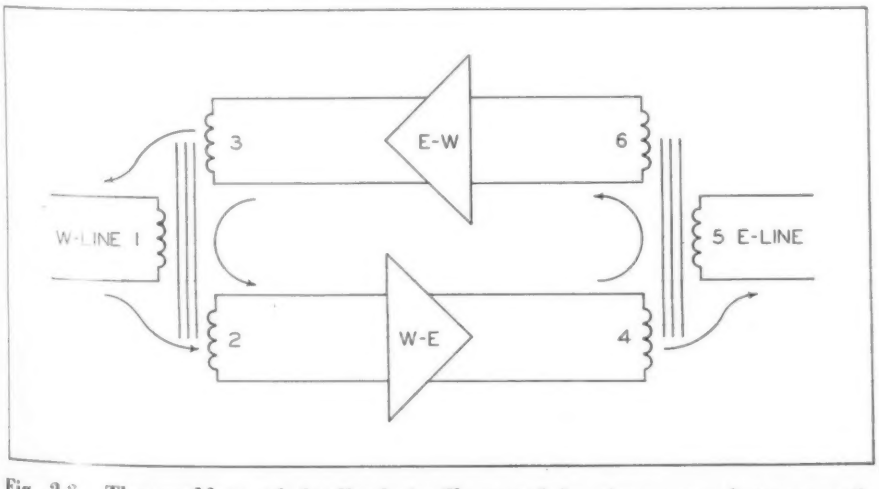

Fig. 2.2. The problem of feedback is illustrated by the arrows between coils 2 and 3 and also between 4 and 6. This drawing is otherwise the same as Fig. 2.1. Feedback occurs when the west voice for example reaches coil 4. While part of the voice goes on to coil 5 and the east line, some enters coil 6 and returns to the direction of origin through the E-W amplifier coil 3 to 1 and the west line. A similar thing can happen to the east voice. When this occurs the repeater sings.

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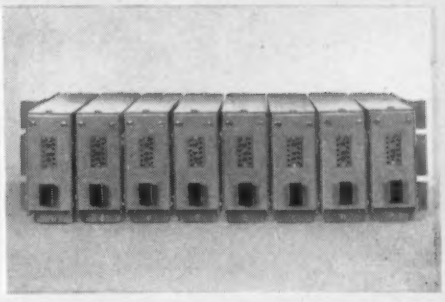
NEW TRANSISTORIZED TYPE 80 MONOPHONE: A completely self-contained transistor amplifier provides extra gain for hard-of-hearing subscribers. Transistor amplifier inside housing amplifies up to 16 times. Convenient volume control behind cradle. Amplifier draws power from line—needs no other power supply. Circular 1823.



NEW TRANSISTORIZED VF REPEATER: Eight complete repeaters on a 19" shelf—only 5¼" high. Each provides maximum gain of 10 db on NL cable or open wire, and 6-8 db gain on loaded cable. Operates on 48-volt exchange battery or a few dry cells. Saves weight and space usually occupied by power supply. No heat dissipation problem—each repeater draws only one watt. No tubes to burn out.

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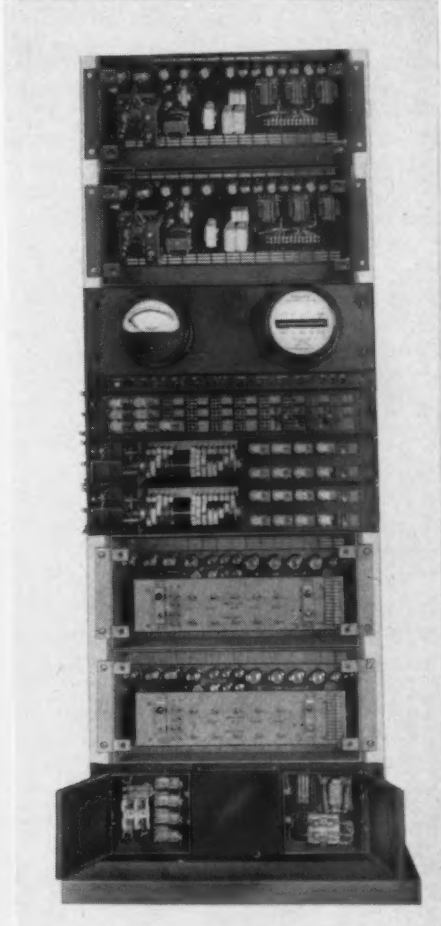
TRANSISTORIZED OPERATOR'S HEADSET: plifies caller's voice up to 16 times. Light-ht transistor amplifier measures only 1⅜x3". Amplifier in plug starts work-when operator inserts plug in position . Needs no power supply. Circular 1823.



ELECTRONIC RINGING MACHINE: Generates electronically five ringing frequencies plus all tones required. Generating equipment has no moving parts to wear. Offers extraordinary frequency stability, low maintenance, and freedom from over-ring and cable noise. Circular 1734.

AUTOMATIC ELECTRIC

ORIGINATORS OF THE AUTOMATIC DIAL TELEPHONE

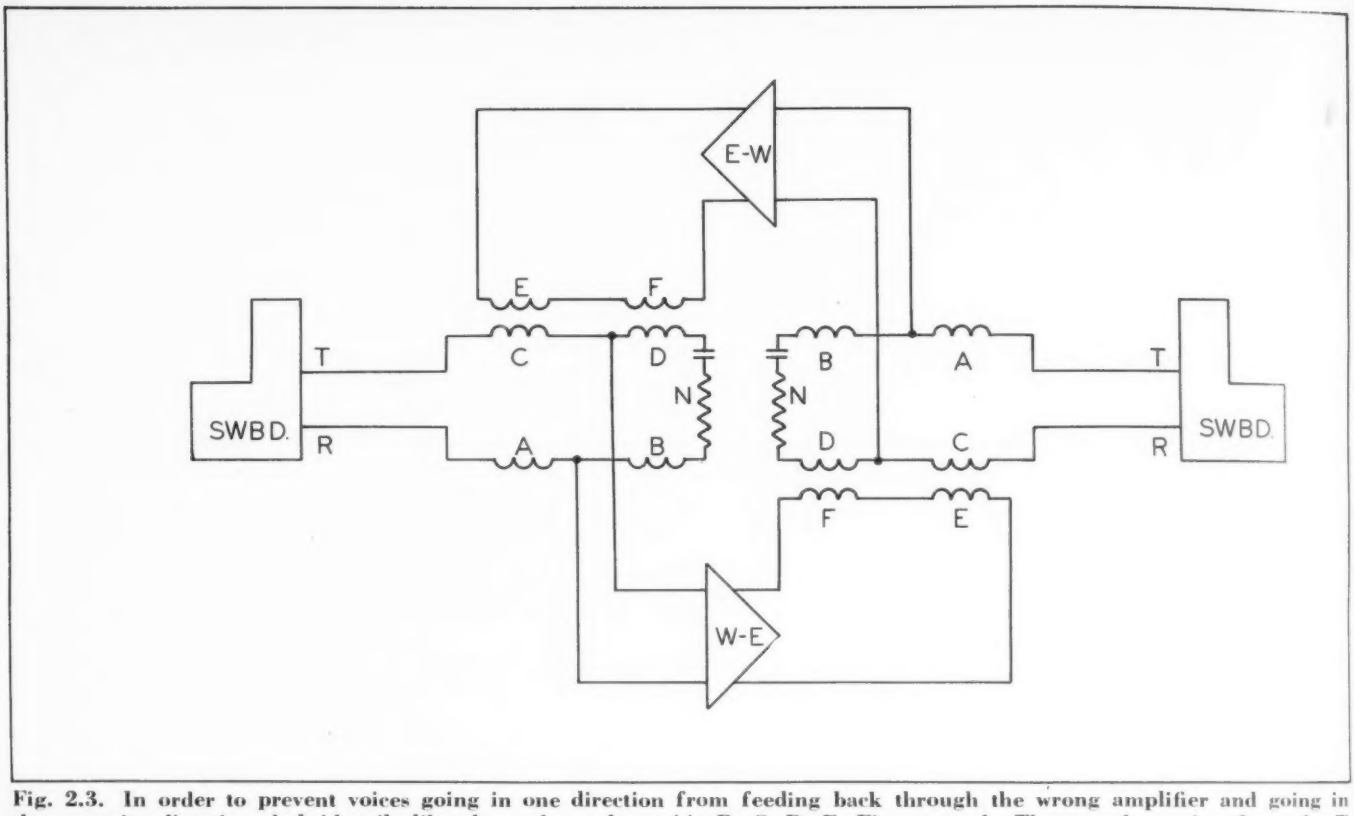


Fig. 2.3. In order to prevent voices going in one direction from feeding back through the wrong amplifier and going in the opposite direction, hybrid coils like those shown here (A, B, C, D, E, F) are used. The speech coming from the T and R of the switchboard goes through coils A and C to the input of the amplifier. An equal amount of voice energy continues on through coils D and B into the network N which has the same impedance as the switchboard. The voice which enters the correct amplifier is sent on to the destination. Some voice enters coils E and F but will not enter the other amplifier because it points in the wrong direction. The route of the amplified voice in coils E and F which comes *from* the output of the amplifier is described in Fig. 2.4.

are equal, the voltage drops across them are equal. The voltages are also opposite (the arrow goes up in one case and down in the other). If the voltages are equal and opposite, they cancel each other out; and no voltage appears at points 1 and 2. If there is no voltage at these points, no current will flow in the E-W repeater input.

Bridge

Another way of looking at this circuit is to regard it as a bridge. Assume that the current coming out of coil D follows the arrow through the net, through coil B to point 2, then heads back up through the E-W amplifier to return to coil D.

However, note that the same thing might happen to the current coming out of coil C. It might try to go down through the E-W amplifier input, through coil A, through the switchboard, and back to coil C, which would be a complete circuit.

Thus, we have traced two currents through the input of the E-W amplifier, but one went upward while the other went downward. If the input coil had two equal currents in opposite direction, they would cancel each other out, with the result that no current would flow. If the network exactly balances the line, this is then the case —no current flows. It is like a Wheatstone bridge circuit with the input

(Please turn to page 46)

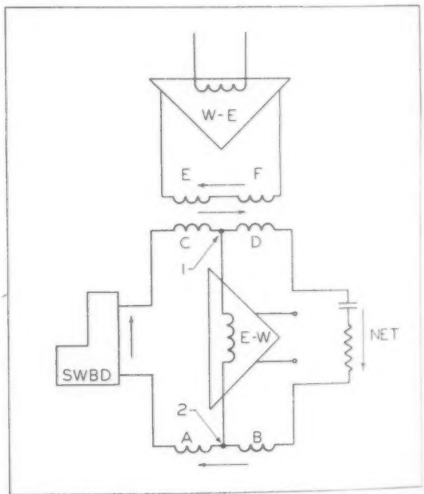


Fig. 2.4. This shows half of the drawing in Fig. 2.3, but with the parts rearranged to show that the E-W amplifier is the same as the galvanometer arm of a Wheatstone bridge. The amplified voice coming from the W-E amplifier output enters coils E and F and is induced into coils C and D. The current path is shown by the arrows—from coil D through the net, coil B then A, to the switchboard, coil C and back to D. If all of the coils are equal in value, and the net has the same value as the switchboard, then there will be no difference in voltage at points 1 and 2. Thus none of the amplified voice from the output of W-E amplifier will get into the input of the E-W amplifier and singing will not occur.

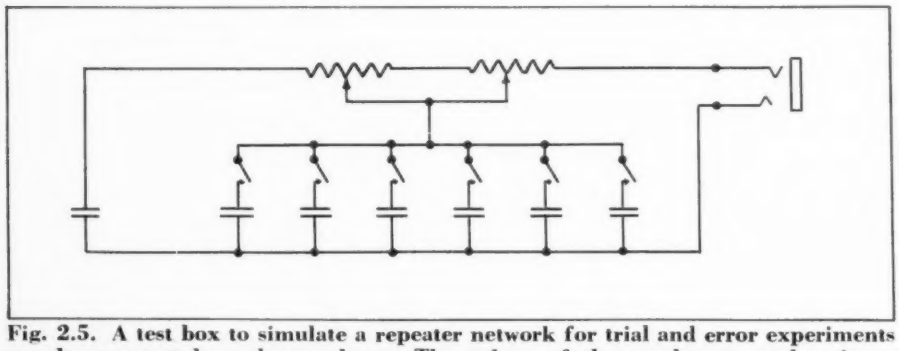


Fig. 2.5. A test box to simulate a repeater network for trial and error experiments can be connected as shown above. The values of the condensers and resistors would be equivalent to those used in the repeater to be tested.

Courts and Commissions

Approve Dial Service Rates For N. C. Independent

Rates for two new automatic exchanges being installed by the Concord Telephone Co. at Harrisburg and in the China Grove-Landis area were approved on Sept. 2 by the North Carolina Utilities Commission. (TELEPHONY, Aug. 20, p. 33).

Harrisburg, 7 miles from Concord, now is served by the Concord exchange and the new automatic exchange will have toll-free connections with Concord. The China Grove-Landis exchange will replace a common battery exchange at China Grove.

Under the rates approved by the commission, business subscribers will pay $7.50 for one-party service, $6.75 for two-party; $6.00 for four-party, and $5.25 for rural multi-party service. Residence subscribers will pay $4.00 for one-party service, $3.50 for two-party, $3.25 for four-party, and $3.50 for rural multi-party service.

Nebraska Commission Permits Exchange to Discontinue

An order of Aug. 29 by the Nebraska Railway Commission authorized the Stockville (Neb.) Telephone Exchange to discontinue service to its 40 customers and to close the exchange, effective Sept. 1. Most of the stations owned by the exchange were on rural switching lines. Town subscribers are largely served by the Frontier Telephone Co.

The owner, Mrs. Edna M. Austin, who operated the exchange by herself and who had made repeated efforts to sell or rent without success, is now in ill health and unable to continue operation.

Five Georgia Independents Authorized to Raise Rates

Georgia Public Service Commission recently approved increased rates for five Independents—the Ellijay, Gray-Haddock, Nelson-Ball Ground, Progressive Rural and Sikes companies.

The Ellijay Telephone Co. gained approval of the following change in rural rates, applicable upon conversion of its exchange to automatic operation:

	Present	*Approved*
Rural multi-party business	$4.50	$5.50
Rural multi-party residence	3.50	4.25

Gray-Haddock Telephone Co.'s new rate schedules apply: (1) effective the first billing date following the commission's order, and (2) upon establishment of extended area service (EAS) between the Gray and Haddock exchanges. Rates authorized are as follows:

	Approved	*EAS*
One-party business	$5.00	$5.25
Two-party business	4.00	4.25
Four-party business	3.00	3.25
One-party residence	3.25	3.50
Two-party residence	2.75	3.00
Four-party residence	2.50	2.50
Rural multi-party:		
Business, 0-2 miles	3.50	3.75
Residence, 0-2 miles	2.50	2.75
For each additional 2 miles or fraction thereof	0.25	0.25

The old and the new Nelson-Ball Ground Telephone Co., Inc. rate schedules are:

	Old	*New*
One-party business	$5.00	$6.00
Two-party business	4.00	5.00
Four-party business	3.00	4.00
One-party residence	3.25	3.75
Two-party residence	2.75	3.25
Four-party residence	2.25	2.75
Rural multi-party:		
Business	4.50	4.75
Residence	3.50	3.75
Urban service extended to rural area per ¼ mile or fraction thereof beyond base rate area:		
One-party		0.40
Two-party		0.20
Four-party		0.10

Authorized rates for Progressive Rural Telephone Cooperative, Inc., Dudley, are applicable when expansion and improvements of certain facilities in the company's five exchanges have been completed. Earlier this year, the commission approved an REA loan, the proceeds of which were to be used to buy telephone properties at Chester, Kennedy and Maddox. Approved rates, which are for extended area service between the five exchanges, are:

One-party business	$6.25
Two-party business	5.25
Four-party business	4.25
One-party residence	4.50
Two-party residence	4.00
Four-party residence	3.50
Rural multi-party	
Business	5.25
Residence	4.00
Mileage: per ¼-mile or fraction thereof beyond the base rate area:	
One-party	0.40
Two-party	0.20
Four-party	0.10

Sikes Telephone Co., Glennville, gained approval of a new rate schedule to apply upon conversion of its exchange to automatic operation. Existing common battery and dial service rates are:

	CB	*Dial*
One-party business	$5.50	$6.25
Two-party business	4.50	5.25
Four-party business	3.50	4.25
One-party residence	3.25	4.00
Two-party residence	2.75	3.25
Four-party residence	2.25	2.75
Rural multi-party:		
Business, 0-2 miles	3.25	4.00
Residence, 0-2 miles	2.75	3.00
For each additional miles or fraction thereof	0.25	0.25

General of Kentucky Asks To Raise Paystation Rate

General Telephone Co. of Kentucky, Lexington, recently filed an application with the Kentucky Public Service Commission, seeking to increase the charge for paystation calls from five cents to 10 cents.

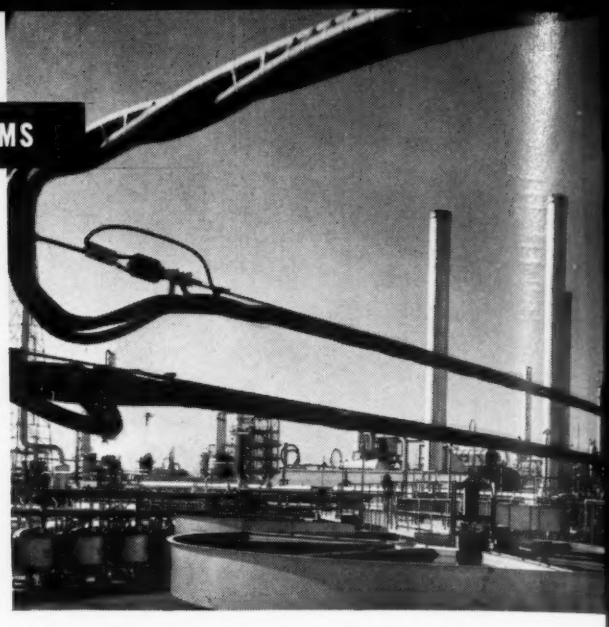
The General Telephone Co. of Kentucky maintains that the 10-cent charge is necessary and reasonable due to increased operating expenses and investment. It is declared also necessary if the company is to continue to develop and expand this type of service to meet public demands.

Ohio Commission Approves Independent's Stock Issue

The Rock Creek Citizens Telephone Co. has received permission from the Ohio Public Utilities Commission to sell $70,000 worth of 6 per cent preferred stock at a par value of $100

(Please turn to page 39)

NACONDA PRODUCTS ENGINEERED TO CUSTOMERS' PROBLEMS



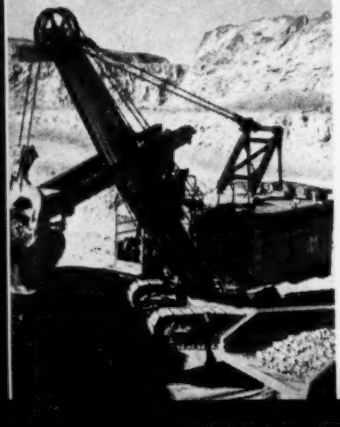
Top resistance to sun, weather, and heat. Good cold flow properti[es] are specially designed into the many aerial cables made by Anacond[a] [lo]ng-life c[a]

New help from an old hand

for Independent Telephone Companies

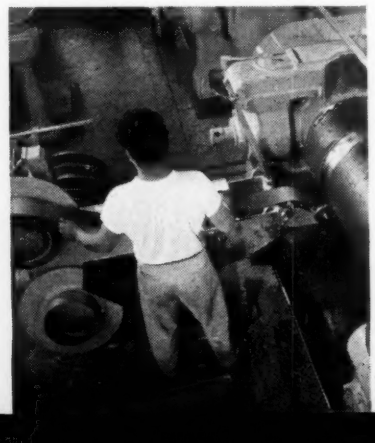
Pioneer in communication cable development. Anaconda contributions include plastic wire, railroad communication cable, spiral-four cable, supervisory control cable, and such types of TV antenna lead-in wire as 300-ohm television line and foam-polyethylene UHF line. Anaconda telephone cable is currently being installed by many REA cooperatives and independent telephone companies.

Highest grade copper—from Anaconda's own mines—metallurgically controlled throughout all manufacturing operations.



Modern machines and skilled technicians assure highest product quality.

Compounding experience of Anaconda ranges from materials for direct-burial and duct to aerial installations.



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ears of direct-burial cable experience enable Anaconda to manufacture g-life cables possessing highest resistance to moisture, soil chemicals and abrasion.

Excellent abrasion resistance and good moisture-barrier properties make Anaconda cable leading choice of users for duct installations.

From Anaconda's complete line of plastic telephone cables, REA cooperatives and independent telephone companies can always select the *right* cable for *every* job. Into these products have been engineered all the experience and know-how gained by Anaconda over many years of communication cable research, development and manufacture.

Whatever your problem . . . wherever you're installing cable . . . you'll find an outstanding Anaconda product to help you.

1. ATC AERIAL & DUCT TELEPHONE CABLE—offered in pair numbers from 6 to 404. Design features eliminate cross-talk, provide lightning protection, minimize transmission loss. REA accepted, lightweight, simple to install and splice. All-polyethylene insulation and jacket resist oils, chemicals, sunlight, ozone, temperature extremes.

2. ATC SELF-SUPPORTING TELEPHONE CABLE—with hard-drawn copper conductors for high tensile strength. All-polyethylene insulation and jacket. No messenger and minimum hardware expense. Long-lived, quickly installed, with fine transmission characteristics.

3. ATC DIRECT-BURIAL CABLE — all-polyethylene insulation, belt and jacket. Flexible, quickly and inexpensively installed, durable and long-lasting under adverse soil conditions. Designed for minimum transmission loss.

4. ATC RURAL DISTRIBUTION TELEPHONE WIRE—polyethylene insulation, special colored polyvinyl chloride jacket . . . high-strength galvanized steel, polyethylene-insulated messenger. REA accepted, all pairs accessible at any point, fully color-coded, easy to splice, distinguished by low transmission loss. Highly salvageable: permits easy removal and re-use.

5. ATC URBAN DISTRIBUTION WIRE—ideal for short multiple service drops. Insulation and jacket of polyvinyl chloride; strong polyethylene-insulated steel messenger. Easy to splice, readily attached to a pole, fully color-coded, and resistant to abrasion, corrosion and temperature extremes.

These cables are sold only through authorized distributors. For complete information, call the Man from Anaconda. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

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Published every week to help you get the most out of your materials and supplies dollar

by C. J. Reynolds, Stromberg-Carlson Company

The few dollars you spend on *reliable* equipment today will be repaid a hundredfold in lower maintenance costs for years to come. Protect your investment with the double guarantee offered by Stromberg-Carlson. First, leading manufacturers build this equipment, and guarantee it. Second, because we recommend and sell this equipment to the telephone industry, we *also* guarantee its performance!

One way to slice cost of line maintenance

Your lines can be no more dependable than the insulators and other equipment holding them. If you're looking for ways to reduce line maintenance, you'll do well to investigate the heavy-duty items shown in our picture.

Physical strength, resistance to weather are two important qualities of these wireline supplies.

These are guy strains, spools and wireholder insulators built especially to withstand the severe conditions of outdoor service. They are brown glazed porcelain, with high insulation values for maximum performance and protection.

Porcelain Products, Inc., the manufacturers, specialize in equipment for the telephone industry.

You can get prompt delivery of these rugged, easy-to-use wireline supplies by ordering now from your Stromberg-Carlson representative.

ST Type Strand Cable Terminals Outstanding Design Features

(1) Rugged Aluminum Terminals—no rusting; suitable for strand, wall or pole mounting.

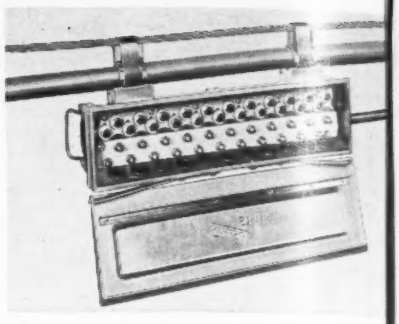
(2) Simple weathertight cover enclosure—no loss of protection when open.

(3) Bronze terminal screws and cable molded in reinforced polyester binding post terminal shell having superior insulation resistance.

(4) Terminal heads gastight and reversible in Terminal.

(5) Protector units 506 for Cable Protector, 504 for Station Protector are separate assemblies. Parts may be renewed. Units provided with carbon to carbon air gap—alloy pellet and secondary metallic grounding.

Available with both plastic and lead stubs.



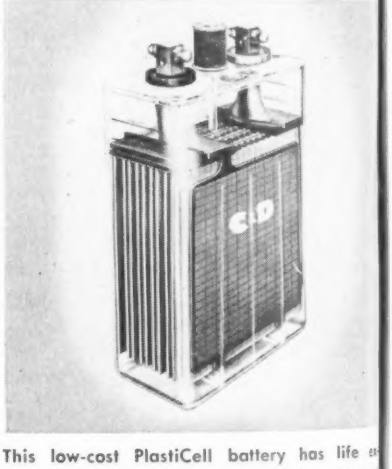
Eleven-pair terminal, like other type S terminals, may have entrance at either end

Made by Reliable Electric Co. "Reliable" identifies the quality your Stromberg-Carlson representative is ready to supply it to you.

A Reliable Electric Specification No. R-100 is available.

These two battery types give you decades of good service

Here's a dependable power supply for you with a life expectancy of **25 years!** It's the C & D Plasti



This low-cost PlastiCell battery has life expectancy of 14 years. Its PlastiCal counterpart will last you 25 years.

Cal telephone battery, and when we say it will last 25 years, we're thinking about **full float service.**

You get this extra-long life because C & D PlastiCal (lead-calcium grids) batteries have an exclusive suspended and supported plate construction.

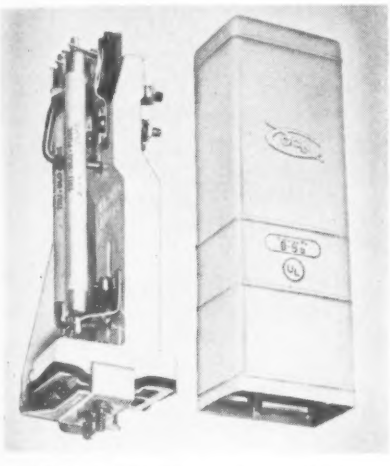
If a 14-year life expectancy will fill your needs, C & D has an economical battery for that, too. It's the PlastiCell battery, using high-tensile lead alloy grids.

In the picture, you see one of these PlastiCell batteries. It's the CE-11 and has a 660 A.H. capacity. In PlastiCal, specify PCE-660.

Both PlastiCal and PlastiCell are available in other capacities. You can order them from your Stromberg-Carlson representative.

Protect telephones from lightning

No larger than a good-size candy bar is the Cook 09u telephone protector shown here. But it can save you a lot of grief and you can protect single circuits, both indoor and out.



Individual circuits are protected by small unit, measuring 6"x2½"x1¾".

The body is a single piece of heavy white glazed porcelain. Lightning arrestors are two Tru-Gap dischargers, two flat carbons mounted on a copper ground, and two A-9u 7-amp. lavite fuses. Neoprene gasket locks out insects, dust, snow, etc.

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and $10,000 worth of common stock. Seventy-two shares of the latter was to replace present common stock at a stated value of $100 per share.

Announcement was made recently by William McClusky, Rock Creek Company president, who also said proceeds from the sales will be used for future expansion. It is planned, he said, eventually to install intertoll dialing systems.

Stock sales were to begin immediately.

Missouri Commission Approves Company's Sale

Mr. & Mrs. J. Coleman Dodson were granted Missouri Public Service Commission authority on Aug. 30 to sell the Morrisville Telephone Co. to the Bolivar Telephone Co. (TELEPHONY, Aug. 20, p. 33.)

Earlier this year Mr. Dodson negotiated an option to sell the Morrisville company to Southwestern Bell Telephone Co. Bell in turn, was reported to have optioned the company to the Bolivar company (TELEPHONY, Feb. 5, p. 44).

Georgia Commission Approves Two Security Issues

Security issues by two Independents were approved by the Georgia Public Service Commission recently.

Seminole Telephone Co., Donalsonville, was authorized to sell $125,000 principal amount of 5 per cent first mortgage 20-year serial bonds to the Citizens & Southern National Bank.

Southeastern Telephone Co., Tallahassee, Fla., gained authority to sell privately to the underwriting firm of Scott, Horner & Mason, Inc., Lynchburg, Va., 50,000 shares of its common stock at not less than $16 per share (TELEPHONY, Aug. 20, p. 34).

Minnesota Co-op to Buy

The Minnesota Railroad & Warehouse Commission on Sept. 6 authorized the transfer of the Langor Township Telephone System to the Paul Bunyan Rural Telephone Cooperative, purchaser. The Langor system serves approximately 44 stations.

Seeks Financing OK in N. C.

The Western Carolina Telephone Co., Weaverville, has asked the North Carolina Utilities Commission for permission to sell 18,500 shares of common stock to finance an expansion and improvement program.

Two Wisconsin Rate Cases Scheduled for Hearings

The Wisconsin Public Service Commission was scheduled to hear, on Sept. 14, the application of the Rhinelander Telephone Co. for authority to increase rates.

The application of the Elroy (Wis.) Telephone Co. for a rate increase was to have been heard on Aug. 24, according to the Madison (Wis.) *Capital Times*.

Pacific T&T Charges Its Directory Was Plagiarized

The Pacific Telephone & Telegraph Co. on Aug. 24 sought an injunction against Owen and Helen Skaggs of Marin County, Cal., charging they plagiarized the telephone directory.

The company said it inserted 12 fictitious names in its own directory and they later appeared in a directory prepared by the couple.

General of the SW Gains Rate Increases in Texas

General Telephone Co. of the Southwest, San Angelo, Tex., was granted the following rate increases in Texas during August:

	Old	*New*
Miami, magneto, 252 stations		
One-party business	$4.00	$ 5.50
Two-party business	3.25	4.50
One-party residence	3.00	3.50
Two-party residence	2.75	3.00
Four-party residence	2.25	2.50
Meadow, dial 94 stations		
One-party business	6.00	9.00
Two-party business	4.50	7.00
One-party residence	3.50	4.75
Two-party residence	3.00	3.75
Del Rio, dial, 4204 stations		
One-party business	9.00	10.00
One-party residence	4.50	5.00
Two-party residence	3.75	4.25
Four-party residence	3.25	3.50

Diamond State Asks Delaware Commission to Retain Raise

The Diamond State Telephone Co. on Aug. 18 asked the Delaware Public Service Commission to continue present telephone rates in Delaware. (TELEPHONY, Apr. 30, p. 35.)

This request was based on recent capital expenditures made by the company to improve and expand its equipment. These expenditures, added to the previous value of the company's property, add up to a figure on which the company's current income is no more than a fair return, Diamond State argued.

The rates were up for discussion at a hearing before the commission as the latest step in proceedings which began in June, 1953, when the company asked

for increased rates. The commission, after a hearing, granted about one-third of the increase requested by the company, which then appealed to the superior court. The court set the rates now in effect.

However, the commission appealed to the Delaware Supreme Court which decided that the superior court should not have set the rates, and directed the commission to set them, giving more weight than it did the first time to reproduction value. The hearing was held as the commission was handling the rate case for the second time.

In its original decision on the rate case, the commission had arrived at a figure of 22 million dollars as the value of the company's property, on which it is entitled to a fair return. The company on Aug. 18 accepted that figure and suggested that its recent investments be added to it.

Officials testified that with the two figures added to produce a new valuation, the rates now in effect are bringing the company a return of 4.95 per cent to 5.55 per cent. An expert employed by the commission put the figure only a little higher—at 5.8 per cent return.

J. E. Winters, assistant comptroller for the company, testified that during the 12 months ended May 31, 1955, the company earned $1,526,000.

For the commission, E. Edward McLean, consultant from Baltimore, testified that the earnings for the 12 months ended May 31, 1955, amounted to $1,587,000 and that the rate of return amounted to 5.8 per cent.

John B. King and David F. Anderson, counsel for the company, argued that the company is not earning as much as it should but is not asking for higher rates at this time.

Authorize Virginia Company Common Stock Sale

The Virginia Corporation Commission on Sept. 8 authorized the Harrisonburg Telephone Co. to issue 22,285 shares of its $10 par value common stock.

Sale of the stock, which must be completed by Mar. 15, 1956, is expected to net approximately $367,702. The money will be applied to financing expenses, payment of outstanding temporary bank loans and continuation of a construction and improvement program.

The program includes conversion of manually operated to automatic equipment on the Bridgewater and Weyers Cave exchanges.

New stock will be offered first to present stockholders at $17 a share. Stock remaining after 23 days will be sold to underwriters for resale to the public.

North Carolina Commission Handles Applications to Buy

The Hickory Telephone Co. has been authorized by the North Carolina Utilities Commission to purchase the Catawba Telephone Co. and to take over its system. (TELEPHONY, Aug. 13, p. 46.)

Hickory Telephone has 14,997 subscribers and absorption of the Catawba company will add 350 to the total.

The latter company was purchased from Leroy P. Spoon, of Charlotte, owner, who told the commission he was selling because he was "not physically able to continue the work of operating a telephone company."

In purchasing the company, Hickory Telephone agreed to consider a request by Catawba residents that they be provided toll-free service between Catawba and nearby Newton.

*

North Carolina Telephone Co. has applied to the commission for permission to buy the Wingate (N. C.) Telephone Co. and to issue 15,000 shares of $1.00 par value common stock to Frank R. Ritchie, Wingate's owner, as part payment.

North Carolina Telephone was organized last March when the Matthews & Waxhaw Telephone Co. bought the Anson Telephone Co. (TELEPHONY, Apr. 9, p. 36).

*

Worth B. Miller of Crumpler, N. C., owner of the Riverside Telephone Co., a line serving about 20 subscribers, on Sept. 7 was authorized by the commission to sell the company to the Skyland Telephone Membership Corp., West Jefferson, an REA cooperative.

*

Southern Bell Telephone & Telegraph Co. has asked the Commission for authority to serve sections of Rutherford and Cleveland counties now served by the Cliffside Telephone Co., stating that Cliffside is anxious to sell.

The petitioner stated that nearly 100 per cent of Cliffside's subscribers signed a petition last March requesting Southern Bell service.

Raise Asked by Ala. Company

The Florala Telephone Co., Inc., has applied to the Alabama Public Service Commission for an upward revision of rates, it was reported recently.

New York Commission Grants Rate Raise to Independent

Chenango & Unadilla Telephone Corp., Norwich, on Aug. 20 was authorized by the New York Public Service Commission to increase its rates $140,000 a year (TELEPHONY, Aug. 20, p. 34).

The commission said the increases affected subscribers of 30 of the company's 32 central offices. It said the revenue is required to enable the company "to continue adequate service and to progress its program of plant development."

Indiana Commission Issues Authority for Purchases

The Washington County Rural Telephone Cooperative has been authorized to purchase the Consolidated Telephone Co. (sometimes called Pekin Telephone Co.) from the receiver, it was reported on Sept. 8.

Other orders issued by the Indiana Public Service Commission and reported on Sept. 8 are:

Theodore J. Anthony was authorized to sell the Merom Telephone Co. and the New Lebanon Telephone Co. to Wayne Johnson.

The Indiana Bell Telephone Co. was authorized to purchase the Summitville exchange of the Union Telephone Co. and to make certain service rearrangements (TELEPHONY, Sept. 10, p. 32).

The Brookville Telephone Co., Inc., was authorized to borrow $70,000 from the American United Life Insurance Co. at 4½ per cent interest.

R. E. and Gladys Brookbank were recently reported to have sold their interests in the Pendleton Telephone Co. to David F. and R. F. Williams. Mr. Brookbank had been associated with the company for the past 38 years. He is the immediate past president of the Indiana Telephone Association. New officers of the company are: David F. Williams, president and resident agent; H. R. Williams, vice president, and Robert F. Williams, secretary-treasurer.

Kansas Independent Gains $19,014 Increase in Rates

A $19,014-a-year increase in rates affecting 1,112 customers of the Suburban Telephone Co., Tonganoxie, was granted on Sept. 7 by the Kansas Corporation Commission (TELEPHONY, July 9, p. 42).

As a condition for the rate raise, the commission directed the company to convert to automatic operation by Mar. 1, 1956. The higher rates will become effective in 30 days.

Coming Up!

OCTOBER 10-11-12

Conrad Hilton Hotel · Chicago

The 1955 Convention of the

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

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INDEPENDENT TELEPHONE PIONEER ASSOCIATION

Annual Business Meeting and Entertainment

**Attendance of Manufacturers and Suppliers Limited to Member Companies*

IN THE NATION'S CAPITAL

Concluded from page 22

subscribers being annoyed with this type of solicitation. When it is being done from a residential station for obvious and continued business type operations, the company can sometimes tactfully eliminate the nuisance by enforcing service rules against doing business over residential telephones.

But, almost invariably any real effort to eradicate telephone solicitation of this type will step on the toes of some popular and respected local, charitable, fraternal, or religious organization trying to raise dollars for worthy causes. Most telephone company public relations officials have had nightmares, at one time or another, over the possibility of seeing their companies crucified in public print for blowing the whistle on some poor widow lady trying to support a family by selling Christmas cards or something like that.

Where a city, by ordinance, is willing to take over the responsibility of enforcement, a different situation is presented. But, even here the telephone company may be called upon to give a ticklish type of assistance to the law enforcement agency. Perhaps it is just as well the city of Portland thought better of its ordinance and has decided to rely on licensing enforcement.

Some day some genius may come up with a solution to that minor nuisance which will be both foolproof and brickbat proof—from the standpoint of company public relations. Until that time comes, most of us will just have to smile sadly and say "no thanks" when the cheery voice on the other end of a telephone call informs us that we have been selected to enjoy the benefits of some magnificent business opportunity, bargain or prize or what else.

REA MAKES 7 LOANS

Concluded from page 23

About 21 miles of existing line will be continued in use and 52 miles will be rebuilt for the expanded system. In addition, the company plans to add 6 miles of new line and construct a new central office and headquarters building in Union. The proposed rehabilitation and expansion will make it possible for the Union Telephone Co. to bring dial service to 407 subscribers in its operating area.

Russell W. Hosmer is president and manager of the Union company.

*

A loan to the West Tennessee Telephone Co., Bradford, Tenn., was approved on Sept. 2 for $488,000, first REA loan to improve and extend rural telephone service in Gibson County.

The company is now providing magneto and common battery service to 993 rural subscribers over 124 miles of line. It plans to convert the system to automatic operation and add facilities to serve 272 families and other rural establishments now without telephones.

The company proposes to continue to use 3 miles of the existing line in the expanded system, and to retire 15 miles. About 106 miles of line will be rebuilt and about 72 miles of new line will be added.

Sites will be purchased and new automatic central office buildings constructed at Bradford and Rutherford. Commercial office facilities will also be housed in the Bradford building. Completed, the system will consist of 181 miles of line.

W. W. Davis is president and M. V. Ferguson is manager of the West Tennessee Telephone Co.

*

Clay County Rural Telephone Cooperative, Inc., on Sept 2 was granted authority to borrow $536,000, its first REA loan. The cooperative, a new borrower, plans a modern telephone system to serve 1,252 rural subscribers in Clay, Owen, Parke and Putnam counties.

The Clay County cooperative was formed by the voluntary consolidation of seven small companies in west central Indiana. It proposes to acquire for a nominal amount properties of the companies. These are the Belle Union Telephone Co.; Mt. Meridian Telephone Co.; Lena Telephone Co.; Poland Telephone Co.; Jackson Township Telephone Co., Asherville; Bowling Green Telephone Co., and the Reelsville Telephone Co.

At this time the companies provide magneto service for 778 subscribers from 211 miles of line.

New automatic central offices are proposed at rural locations to serve three exchange areas of the new system: Poland, Reelsville and Mt. Meridian-Belle Union. In addition, a new headquarters building will be constructed in Poland. Of the existing pole line, 10 miles will be retired, 7 miles used in the new system and 194 miles rebuilt. About 97 miles of new line will be added. The rehabilitation and new construction possible under the REA loan will enable the co-op to offer improved service to the existing subscribers and initial service to 474 families and other rural residents now without telephones. The completed system will consist of 298 miles of line. Service without toll charge between the Poland and Reelsville areas is being considered by the borrower.

Virgil Telgemeyer is president and Cedric A. Ray is coordinator of the Clay County cooperative.

Obituaries

JOHN W. MORRISON, 74, former president of the Rochester (N. Y.) Telephone Corp. and active in the company for 44 years, died on Sept. 5 at his home.

He would have been 75 years old on Sept. 26.

A native of St. Louis, Mr. Morrison went to Rochester in 1906 as purchasing agent for the Rochester Telephone Co., and soon afterward became chief engineer.

He had charge of the consolidation of the properties of the Old Home Telephone Co. and the New York Telephone Co. when the two companies merged in 1921 to form the Rochester Telephone Corp.

On Mar. 1, 1935, Mr. Morrison was named vice president in charge of engineering. He remained in the engineering department until he was made president on Jan. 1, 1946.

He retired on Sept. 30, 1950. He was a director of the Rochester Telephone Corp. at the time of his death.

*

JOHN W. DUNHAM, 32, assistant to the general manager of the Durham (N. C.) Telephone Co., died on August 30. He had been connected with the company since World War II.

*

MINNIE HERRON, 84, former chief operator of the Lincoln (Neb.) Telephone & Telegraph Co. at Burchard, Neb., died on Sept. 1 at a nursing home at Pawnee City after an extended illness.

Mrs. Herron was born at Mt. Pleasant, Iowa, and after a short residence at Washington, Kan., moved to Burchard in 1905 where she had since made her home. She was employed by the Burchard Telephone Co. in 1907 as an operator and became chief operator-cashier of the Lincoln company in 1929 when that company purchased the exchange from the Burchard company. She retired on pension in 1948. She is survived by two daughters and three sons.

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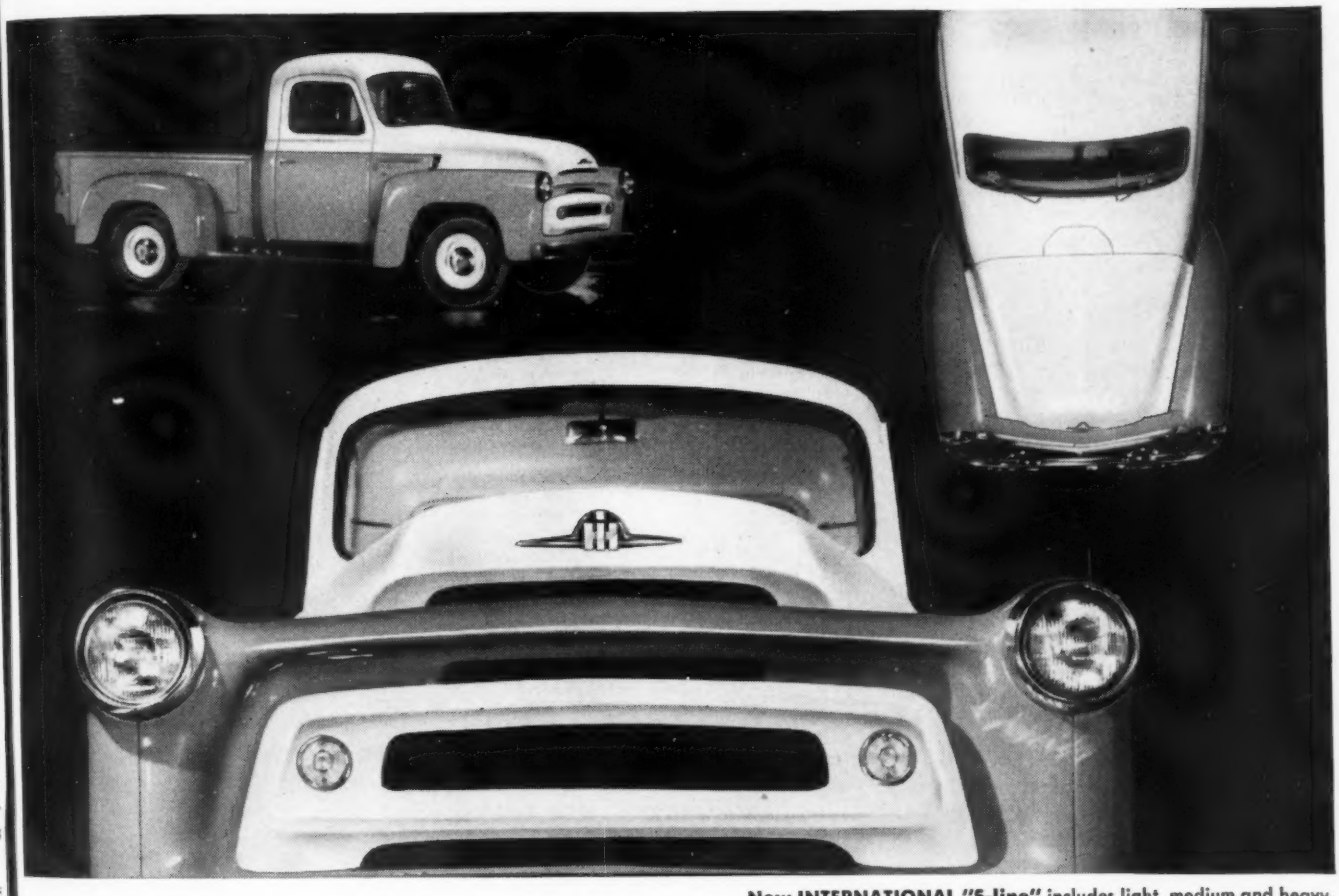

New INTERNATIONAL "S-line" includes light, medium and heavy-duty models from 4,200 to 33,000 lbs. GVW, with 10 gasoline and LPG engines, every modern truck feature.

Functionally styled for practical good looks!

Here are the new INTERNATIONALS . . . a great new truck line from *any* point of view! Their clean-lined styling is trim and functional — designed to take the rough going of truck work without excessive repair costs.

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D. C. Power Featured in Employers Mutuals' "Story"

In the national advertising campaign of the Employers Mutuals, Wausau, Wis., Donald C. Power, president of General Telephone Corp., was the featured personality in the Employers' "Wausau Story." The ad appeared in *Business Week* (Sept. 10 issue), *Newsweek* (Sept. 12) and *U. S. News & World Report* (Sept. 16) and was to have appeared in *Saturday Evening Post* (Sept. 17), and *Time* (Sept. 26).

Wausau is an exchange of General Telephone Co. of Wisconsin. Mr. Power is shown in the ad inspecting new telephone lines being erected on the outskirts of Wausau, and, in another picture, receiving a copy of a Wausau newspaper "hot off the press" from a pressman.

Mr. Power is quoted, in part, on his impressions of Wausau, as follows:

D. C. POWER

"In my business, you *expect* the unusual. But still, I was a bit amazed by some of the things I found in my recent visit to Wausau, Wis.

"Take the old nickel-plated dial phone . . . It was used about 1907. I found it on the desk of Russ Stensrud, manager of the Wausau exchange, a part of the General Telephone System. And discovered that Wausau was the first community in the country to have an exclusive dial system . . . 50 years ago!

"There are other unusual things about Wausau. The pine woods which circle the city hum with activity of a dozen major industries, from mining to woodworking. Of special interest to me is the fact that, in the last five years, Wausau has added more than 20 million dollars worth of well-landscaped homes and plants. I saw them.

"And yet, Wausau never outgrows its friendly spirit! You still see it everywhere. I even got my copy of the daily newspaper handed out to me on the sidewalk, right from the pressroom.

"I can understand why a company like Employers Mutuals has grown so large. With Wausau people to guide it, and Wausau's energetic personality behind it, you have the right kind of people to do business with from the start."

Darrow of Carolina T&T Retires after 33 Years

W. Carter Darrow, assistant vice president of the Carolina Telephone & Telegraph Co., Tarboro, N. C., retired on Aug. 30 after being with the company since Jan. 1, 1922.

Before joining Carolina Telephone as traffic manager he was with Southern Bell at Raleigh and Asheville, N. C. In the more than 30 years he has served Carolina T&T he has served as commercial manager, commercial and traffic manager, general commercial manager and as assistant vice president.

L. W. Hill, president, and other top officials and department heads of the company honored him at a luncheon and open house upon his retirement.

Bell System Adds WKRG-TV To National Network

Station WKRG-TV, Mobile, Ala., was connected to the Bell Telephone System nationwide network of television facilities on Sept. 5.

The Long Lines Department of American Telephone & Telegraph Co. said network programs are fed to WKRG-TV from a transmitter at Mt. Vernon, Ala., which is a station on the Meridian, Miss.-Pensacola, Fla., radio relay route.

Local interconnection in Mobile between the telephone building and the station's studio was furnished by the Southern Bell Telephone & Telegraph Co.

With the addition of station WKRG-TV, network programs now reach 371 stations in 246 cities in the United States.

New Missouri Cooperative Elects Officers, Directors

George Holman of Bevier, Mo., has been elected president of the newly organized Chariton Valley Telephone Co.

Directors elected by shareholders are F. G. Nickerson of Bucklin; E. J. Poeschl of Bynumville and James Rice of New Cambria.

Vernon Bellows Dies

As this issue went to press, word was received that Vernon Bellows, general superintendent of Hunt telephone properties, Blair, Neb., and president of the Nebraska Telephone Association, died suddenly on Sept. 8.

Rolatape

THE MODERN, MOBILE MEASURING INSTRUMENT

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Model "400"

MODEL "400" This Model is a favorite and is widely used by Telephone Companies and other Utilities, paving contractors, land appraisers, etc. It's four-foot circumference measuring wheel makes it most suitable for measuring fairly rough terrain. Automatic measuring counter can be reset at any distance. Folds compactly.

MODEL "200" A popular Model for interior and exterior use. Tabulates wall-to-wall, vertical, or a 101 other measuring assignments. Folds compactly for kit or glove compartment.

MODEL "600" For cross country acreage measurement and work on rougher terrain.

NOTE—All Rolatape Models are designed to tabulate accurate measurements, and are constructed for long and dependable service. With Rolatape, you measure as you walk.

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- TELEPRENE Drop Wire of the highest quality that you can reorder with confidence.
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- A reputation for reliability built up over 56 years in the wire manufacturing business.
- A modernly equipped plant where the best manufacturing methods guarantee the best products at savings to you.
- Employees with years of experience in the fine art of wire making.
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For full value from your DROP WIRE DOLLARS be sure you're getting this complete service. Through our distributors, we are always prepared to handle your requirements.

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There's an easy way to save money on switchgear, signal and alarm systems or emergency light and power applications.

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VOICE FREQUENCY REPEATERS

Continued from page 34

transformer in place of the galvanometer.

In actual practice such a balance cannot be obtained, for the reason that different manufactured parts — the coils, condensers, and resistors cannot be made identical in characteristics. A further complication is the fact that the switchboard is not the end of the line in a telephone connection. At the switchboard, the call is connected to other circuits—ultimately to a subscriber's line. Each of the different circuits to which this repeatered circuit may be connected is of different length or other characteristics. Therefore, the impedance is different on every connection. Of course, the network can only be a compromise between the expected range of conditions.

Another factor which must be considered in lining up a repeater is on-hook and off-hook conditions or talking versus signaling conditions. Whether or not the receiver is on the hook makes a big difference in the impedance of the line and the circuits to which it is connected. Often a repeater may work satisfactorily during talking conditions, but will sing when the parties hang-up. This singing may cross-talk into other circuits and result in complaints.

To understand how an unbalance between the net and the switchboard can cause a feed-back, return again to *Fig. 2.4*. Suppose the switchboard has higher impedance than the network, instead of being equal. The current which arises in coils C and D follows the arrow through the net. Part of this current returns to the coils through the switchboard loop; but because the impedance is higher, some of the current detours up through the E-W amplifier input, thus heads back to the west where it started, and so causes singing.

From a voltage standpoint, we can say that under these conditions the voltage drops across the net and the switchboard are not the same; so the difference voltage appears at point 2. This makes a difference of potential between 1 and 2, therefore, current will flow through the input coil between these points.

From the current viewpoint, wherein we assumed that currents actually tried to flow in opposite directions through this input coil, we can analyze as follows when the switchboard and net are unequal:

The current from coil D, which goes through the net and upward through the input transformer, is no longer the same as the current from coil C which flows downward through this coil. Therefore, cancellation is not complete and some amount of current flows in the input coil of the E-W repeater causing feed-back.

Lining-up

In lining up a repeater for service, some of the necessary adjustments can be made in advance on some equipments, if enough data on the impedance of the connecting circuits are known. However, adjustments in the field are often necessary with the best of systems and certain test equipment is required. With the type of repeater under discussion in this chapter, a simple test box can be made up by the plant forces after the style shown in *Fig. 2.5*. This consists of a number of condensers which can be connected in parallel by means of small toggle switches or switchboard keys and a couple of series rheostats by which the amount of series resistance may be varied. It may also include certain fixed components, such as a network to simulate a subscriber set, if the box is always to be used on circuits which will require these. This type of set is usually used for non-loaded subscriber lines.

The test box may actually consist of two complete sets as described above in order that both networks in a repeater may be adjusted at once.

In actual practice, when a repeater is connected into a line, the regular network in the repeater would be disconnected and the test box connected to the network terminal with some trial amount of resistance and capacity switched in. The volume controls on the repeater would then be turned up until the repeater began to sing. Adjustments on the test box would then be made until the singing stopped, and the volume would be again turned up. Again, at the singing point, the combinations on the test box would be changed.

This practice would be continued until the required amplification was reached or until the singing could no longer be stopped with the test box. After this point has been reached, the volume controls on the repeaters would be backed down by an amount determined by local experience. The idea in this is to set the repeater amplification low enough so that it will not sing under different service conditions—that is in either on-hook or off-hook condition, or when con-

3 BENEFITS a FITCHBURG CHIPPER brings to your line clearance operation

New Jersey Bell Telephone, Vineland, praises Fitchburg Chippers

NEW JERSEY BELL TELEPHONE COMPANY

17 LANDIS AVE.

VINELAND, N. J.

S. B. DUBIVSKY
DISTRICT PLANT SUPERINTENDENT

Mr. W. O. Forman, President
Fitchburg Engineering Corporation
Fitchburg, Mass.

July 28, 1955

Dear Sir:

Line clearance work in this part of New Jersey is of such proportions that disposal of brush is a continuing problem of expense and maintenance of good public relations.

We are glad to report that, in our opinion, the Fitchburg Chipper does the job at low cost and eliminates many of the problems which accompanied the loading, hauling, dumping or burning of brush and cuttings.

Chipping, as a method of disposal, has produced a favorable reaction in the attitude of governing bodies and the general public which we hope will continue to operate to our advantage in securing and maintaining line clearance.

The chipper has also produced an important dividend in the reduction of possibility of accident arising from multiple handling and disposal. In this connection, we are favorably impressed with those design features of the Fitchburg Chipper which provide for the safety of operating personnel.

Very truly yours,

S. B. Dubivsky
District Plant Superintendent

sbd-a

FITCHBURG ENGINEERING CORPORATION

FITCHBURG, MASSACHUSETTS

You'll be interested in how the 3 big Fitchburg Chipper benefits listed below apply to your operation. Read what New Jersey Bell Telephone, Vineland, says about their experience.

1. **Low cost brush disposal.** Fitchburg Chippers help get your line clearance job done with fewer men, less equipment, less cost. No more loading, hauling, dumping, burning. Chips are blown to side of road or right of way.

2. **Good public relations.** Wood chips provide a neat, organic soil dressing that stays in place—helps keep up roadside appearance, keep down weeds. Where chips cannot be left on job-site, most crews give chips to the nearest farmer or gardener for use as valuable mulch.

3. **Safety in operation.** The Fitchburg Safety Spring, or spring-loaded feed plate not only assures equal ease in chipping all sizes of wood to the machine's rated capacity; it also provides an added safety factor—aids in protecting the operator in case metal or foreign material is accidentally fed into the machine.

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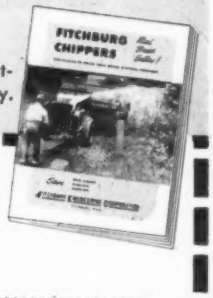

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Fitchburg, Mass., Dept. T-95

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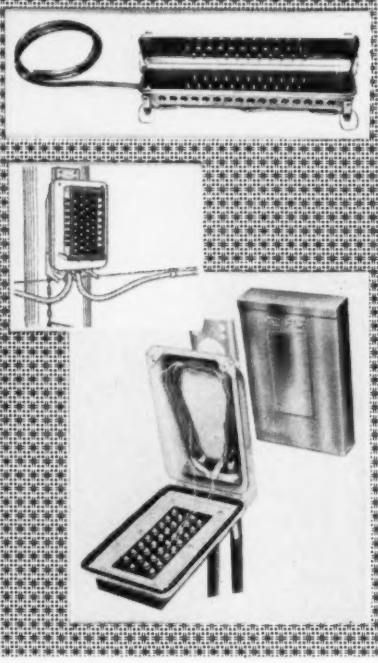

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Cook Met the Need

From their years of experience in making protection equipment Cook Electric Company brings us two special products properly designed for the new cable.

The "Stranterm"

A special light-weight terminal that can be mounted any place on the messenger strand, with optional "Minigap" protectors to be installed only as you need them.

The "PLX" Terminal

The most versatile terminal for plastic cable which enables any lineman to distribute the cable pairs in any manner desired with no soldering or joint wiping. Involves no moisture problems. Heavy metals for long service.

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LAWRENCEVILLE ILLINOIS

nected to other circuits of varying length.

Test Calls

In making these adjustments, trial calls should be made under such different conditions as are possible. Repeaters, which are connected to long subscriber lines, will require that the line be plugged out and the receiver left off the hook while trial is being made. Other circuits may require actual simulation of service conditions such as through connection to a distant telephone. In this connection, it should be noted that all apparatus connected to a line will have an effect on the balancing of a repeater. A subscriber line equipped with an extension telephone, for example, may cause a repeater to sing if users at both the main station and extension attempt to listen at the same time.

Correct Balance

When a correct balance has been obtained by trial and error on the test box, the permanent network in the repeater should be connected up to equal the condition obtained on the box. Whatever amount of capacity is cut in by the switches on the test box should be soldered into the permanent network on the repeater. With the resistance, the correct amount can be read from the dials on the test box if it has been calibrated, or measured with an ohmmeter. The equivalent amount should be soldered into place on the fixed resistances in the network.

No values for the condensers and resistances have been shown in *Fig. 2.5* because these will vary with repeaters of different manufacture. The one shown here was made up by taking an actual network out of a repeater, substituting rheostats for the fixed resistors, and equipping each condenser with a toggle switch.

Some repeaters which are used on loaded circuits use a prefabricated network which matches the line facilities. No adjustment is needed with such fixed networks.

(To Be Continued)

National Safety Council To Convene in Chicago

Safety men from all fields—industrial, traffic, farm, school and home—will converge in Chicago, Oct. 17-21, to attend the 43rd national safety congress and exposition, the annual convention of the National Safety Council.

More than 12,000 persons are expected to hear some 600 program participants at 200 sessions discuss the latest methods of saving life and limb by preventing accidents.

In the industrial field alone, 25 complete programs conducted by the industrial sections of the council will cover new developments in safety in such industries as public utilities, automotive and aircraft manufacture, chemical, construction, food, metals, mining, petroleum and wood products.

In these section meetings topics will range from the safe handling of jet, rocket and guided missile fuels to heart fibrillation as a result of low voltage shock.

In addition to these specialized meetings, the American Society of Safety Engineers will sponsor sessions of general industrial interest. Prominent safety engineers will discuss new developments in isotopes and reactors, industrial noise control, accident cost accounting and the human element in industrial accident prevention.

Arthur Secord, director, community service and professor of speech, Brooklyn College, will give a series of four "early morning" talks on communication and safety. He will tell how to sell safety, how to criticize tactfully and how to make recommendations that bring results.

Congress meetings will take place at the Conrad Hilton, Blackstone, Congress, La Salle and Morrison hotels.

The 1955 exposition will consist of 256 booths displaying all types of accident prevention equipment. All exhibit space in the Conrad Hilton hotel will be filled with products, equipment and services relating to the promotion of safety, health, first aid, sanitation and general welfare. Special space has been allotted to educational displays sponsored by the American Medical Association, National Bureau of Standards, National Society for the Prevention of Blindness, and Underwriters' Laboratories.

Buffalo, N. Y., Authorizes Paystations on City Land

The recent signing of Buffalo, N. Y., Mayor Pankow of a local law allowing the placement of telephone booths on city property will result in the installation of 500 such booths in the next few years, it was reported on Sept. 2.

District Manager Fred C. Boyd of the New York Telephone Co. said passage of the legislation culminated years of effort by the company to get such permission. "Placement of these booths at every major intersection in the city will be a real service to the public," Mr. Boyd said.

He explained that the paystations will be available 24 hours a day and will be lighted.

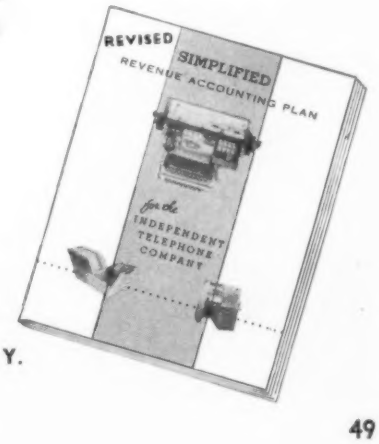
Good friends get together at the

U·S·I·T·A CONVENTION

Be sure to visit Rooms 544A-546A at the Conrad Hilton Hotel, Chicago, October 10-12 when you attend this year's USITA Convention. You'll meet many good friends of the telephone industry there — systems and equipment produced by Remington Rand to help you build profits through more efficient procedures.

You'll enjoy getting acquainted with our new Customer Service Counter that permits maximum protection of records from fire, and with the Kolect-A-Matic equipment that makes possible the Remington Rand Simplified Revenue Accounting Plan, the first *complete* accounting system ever developed specifically for independent telephone companies.

Experienced telephone men will recognize instantly the incomparable virtues of each. And these are but two of the many Remington Rand products of interest to you that will be on display.



If for some reason you are unable to visit us, write for Folder SC246 for detailed information about our Customer Service Counter, and Booklet X1643 for a copy of "Simplified Revenue Accounting Plan for the Independent Telephone Company." Address Room 1995.

Remington Rand 315 Fourth Ave., New York 10, N. Y.

DIVISION OF SPERRY RAND CORPORATION

LADDERS-USE IN TELEPHONE INDUSTRY

Continued from page 28

them from slipping. Where stepladders are used on highly polished floors, it may be safer to have a non-slip material on the bottom of the front section. High stepladders should be held to prevent their upsetting.

Many different types of non-slip bases, such as cork, rubber, fiber, abrasive metals, steel points, and various combinations, are available, but experience seems to indicate that no one type of base can be depended upon under all conditions.

One development which is attracting the attention of ladder users, is a mechanical ladder leveling device, which keeps extension, A-frame and straight ladders level on slopes, steps and irregular surfaces with a 9½-inch differential. The level instantly locks automatically when it is placed on the uneven surface.

There are three different feet which can be installed on the ladder level: (1) Standard foot with a non-skid four-ply synthetic rubber pad for oil or water-covered surfaces; (2) a cleat for a variety of terrains such as sleet, ice, soft asphalt, grass, etc.; (3) special cleated foot which digs in on surfaces. These special feet may be interchanged quickly.

It is advisable, according to some operating telephone companies, to replace the top rung on a portable ladder with a chain for work on cylindrical objects such as poles, trees and round columns. Such an arrangement will prove to be of considerable help in preventing the ladder from slipping sideways. A device known as a pole grip may also be attached to the top of a ladder. This grip is constructed of high tensile strength cotton webbing with cord in neoprene. It will hold a ladder firmly against any pole, pipe or corner. Ladders used for special purposes such as cable splicing, may be equipped with hooks at the top to fit over the messenger strand. When the ladder used for cable splicing is not equipped with these hooks the top should be securely lashed to the messenger strand with rope to provide the required safety.

Another device known as a wall grip can also be attached to the top of any straight ladder or extension ladder. This grip is constructed of cord in neoprene and will hold the top of the ladder securely against any type wall. The safety of any ladder is materially increased by the prevention of side slipping with this device.

Metal parts or fittings used in the construction of ladders should be made of steel, wrought iron, malleable cast iron, or equivalent metal unless otherwise specified in the Wood Ladder Code. The metal bearings of locks, wheels, pulleys, etc., should be frequently lubricated, and damaged, frayed or severely worn rope replaced.

The proper care of ladders is most important because it affects their strength which, in turn, affects the lives of the individual workers who must use them. The National Safety Council suggests that ladders be kept clean and free from dirt or paint which might conceal defects. The Wood Ladder Code now permits the painting of ladders if certain conditions are complied with. The code specifies that the painting of wood ladders is satisfactory provided that, before being painted, the ladders are carefully inspected by competent and experienced inspectors acting for, and responsible to, the purchaser, and provided also that the ladders are not for sale. Wood ladders in general use may be shellacked, varnished, or given at least two coats of linseed oil as a protective coating.

Wood does not deteriorate with age when protected from adverse exposure and from decay. Hence, wood ladders properly used, cared for, and maintained, will have long life and give continued good service over many years.

In keeping with this trend of thought, the Forest Products Laboratory, Forest Service, U. S. Department of Agriculture, suggests the use of a transparent finish, such as varnish, shellac, or a clear preservative. With such a finish, or, if unpainted, the ladder can be inspected from time to time for visual defects. Painting may increase serviceability and reduce splintering, as well as improve appearance, but will not increase durability, nor will painting assure resistance to decay.

It is sometimes considered necessary to mark all portable ladders with the name of the company. In many telephone companies, all ladders are numbered serially so that none will be overlooked during periodic inspections. Some companies also stencil the placed-in-service date on all ladders.

Ladders should be stored where they will not be exposed to the weather and where there is good ventilation. They should never be stored near radiators, stoves, or steam pipes, nor in other places subject to excessive heat or dampness. The following methods of storage are recommended:

The stormiest weather is a breeze for Armstrong Glass Insulators. They're made of tough industrial glass that stands up to punishing line strains and severe thermal shock. For full details on these rugged insulators, write direct to Armstrong Cork Company, 295 Fifth Ave., New York 16, N. Y.

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With Whiz Tubes—the new, low-cost pneumatic ticket tube system—rate and route desks and switchboards are never more than 25 ft. per second apart! Operators send and receive toll tickets with the speed and convenience of plugging in a jack.

Whiz Tubes, engineered and installed by International Standard Trading Corporation, associate of International Telephone and Telegraph Corporation, are suitable for all types of exchanges. Combining pressure and vacuum principles, the system uses a minimum of space and power. No revolving parts at switchboard and rate and route desk—just small, conveniently located sending and receiving terminals. Corrugated tubing gives extra reliability—minimizing the effects of static, friction, and humid air on ticket flow.

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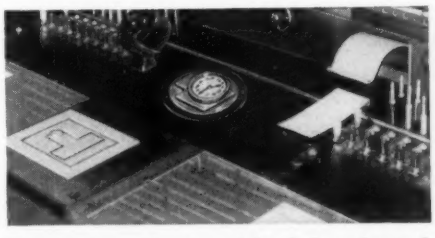
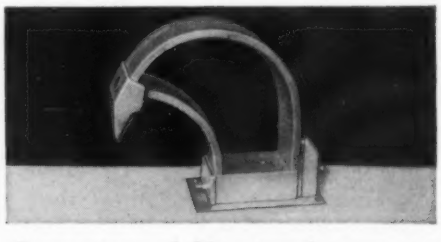


Pressure receiver at right, below the jack panel, delivers a ticket. Operator's vacuum sender is at left. Pressure senders are similarly flush-mounted in rate and route desks.



Compactness of this automatic vacuum receiver permits mounting multiple banks of units in a minimum of space on rate and route desks.

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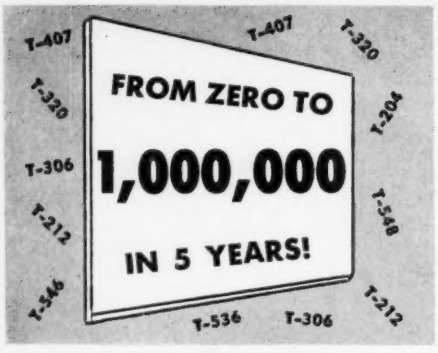
22 Thames Street, New York 6, N. Y.



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(1) Ladders can be hung on brackets against a wall. For long ladders, there should be more than two supports to prevent permanent warping.

(2) Ladders should be placed on edge on racks or rollers rather than flat. This method will prevent trouble when a ladder is removed from storage for use on the job.

(3) Ladders carried or stored on vehicles should be adequately supported to prevent their sagging, and securely fastened in position to minimize chafing and the effects of road shocks.

Unless a ladder is properly handled, construction, design, and care may mean little in today's safety world. The design may be created by a skilled engineer, and the ladder's care may be administered by the most thoughtful maintenance officials, but most important to ladder safety is correct handling. Ladders are primarily a means for ascending or descending from one level to another. They should not be used as working bases except in an emergency or for short periods of time. When any certain job requires tools and materials or is of considerable duration, a platform ladder, ladder tower, or similar working base should be provided.

The National Safety Council recommends that workers observe the following precautions in placing ladders:

"(1) Place a ladder so that the horizontal distance from the base to the vertical plane of the support is approximately one-fourth the ladder length between supports. (For example, place a 12-foot ladder so that the bottom is 3 feet away from the object against which the top is leaning.)

"(2) Do not use ladders in a horizontal position as runways or as a scaffold. Single and extension ladders are designed for use in a nearly vertical position with the base removed from the wall and cannot be safely used in a horizontal position or with the base at a greater distance from the wall than that indicated in (1) above.

"(3) Never place a ladder in front of a door which opens toward the ladder unless the door is locked, blocked, or otherwise guarded.

"(4) Do not place a ladder against a window pane or sash. Securely fasten a board (not with nails) across the top of the ladder to give a bearing at each side of the window. On wide windows with metal sash, the bearing may be across the mullions or between window jambs.

"(5) Place portable ladders so that both side rails have secure footing. Provide solid footing on soft ground to prevent the ladder from sinking.

"(6) Be sure that ladder feet are not placed on movable objects, but on a substantial and level base.

"(7) Never lean a ladder against an unsafe backing, loose boxes, barrels, or round objects.

"(8) When you use a ladder on a roof, securely lash or otherwise fasten the ladder to prevent its slipping."

The National Safety Council also recommends that workers observe the following safe practices in ascending or descending ladders:

"(1) Hold on with both hands when going up or down. If materials must be handled, don't try to carry them but use a handline.

"(2) Always face the ladder when ascending or descending.

"(3) Never slide down a ladder.

"(4) Be certain that your shoes are not greasy, muddy, or otherwise slippery before you climb a ladder.

"(5) Do not climb higher than the third rung from the top on straight or extension ladders, nor the second tread from the top on stepladders."

Always place a ladder where work is within easy reach and take time to move it, to avoid over-reaching. Make certain also that stepladders are fully spread and locked with all four legs on a firm level base before climbing. Then the workman must never stand on top of a stepladder. The second

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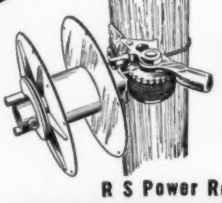
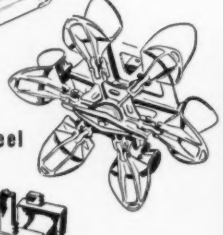
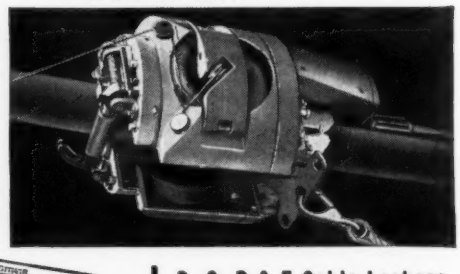
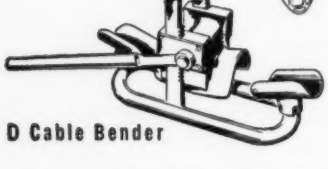

R S Power Reel


C R Power Reel

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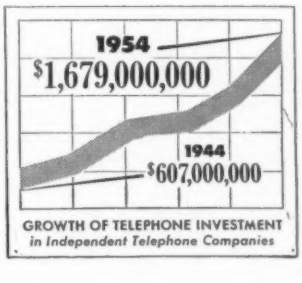

GROWTH OF TELEPHONE INVESTMENT
in Independent Telephone Companies

Independent Telephone Companies of America

United States Independent Telephone Association • Pennsylvania Building • Washington, D.C.

This is the 18th United States Independent Telephone Association advertisement in its campaign to publicize the Independent telephone industry. The ad was to have appeared in the Sept. 19 issue of *Time*, Sept. 23 issue of *U. S. News & World Report*, and in the September issue of *Farm Journal*.

or third step down from the top is much safer.

When carrying a ladder about a job, workers should be instructed to keep the front end high enough to clear a man's head and the rear end near the floor. Extreme care should also be exercised when carrying ladders through doorways, passageways and around corners. Some operating telephone companies have rules that require ladders be carried waist high by means of a strap securely fastened to one side of the ladder. This strap can be hung from the shoulder of the arm that carries the ladder.

Ladders should be carefully inspected at regular and frequent intervals. Some telephone companies require these inspections at intervals of three months. An accurate record should be maintained of each inspection and when one or more defect is located in any ladder, it should be immediately withdrawn from service for repair or destruction.

We are frequently asked for information as to how ladders may be tested to make certain that they are safe for use. The Forest Products Laboratory states that there is no simple, satisfactory method of proof-testing wood for strength, and any test loading much beyond the design load may result in serious damage to the side rails. Sometimes a ladder is tested by supporting it horizontally on horses at the ends and having a man jump on it at the center.

Such a test method should never be used because it subjects a ladder to more severe loads than it was ever intended or designed to carry and because, even if it does not fail, it may sustain injuries in the form of compression failures that may be the source of sudden failure and serious accidents in future use. Hence, don't test that ladder, but rather give it a critical visual inspection to insure that it meets all needed requirements. Since wood lends itself satisfactorily to visual inspection, reliable manufacture and inspection will insure a ladder of good quality and strength that affords safety with proper use and careful maintenance.

A new device recently placed on the market is designed to provide greater safety for workmen who use extension ladders. This is accomplished by the use of a body belt similar to a lineman's. Two stainless steel hand grips are attached to adjustable nylon straps which are in turn snapped to D-rings in the belt. The grips fit the hands like a glove and the lightweight nylon strap is hardly noticed. The grips latch onto the rungs automatically as the workman climbs. A gentle hand pressure unlatches the grips automatically. The grips may be left attached to the ladder as a safety measure while the man is working or they can be detached and hung in the belt. If a man should slip while either grip is attached to a rung, the belt will prevent a fall. This device is especially recommended for use in climbing stationary ladders on radio towers, standpipes, etc.

In the preparation of this article, we have attempted to assemble information on the important but often neglected subject of ladders. It is hoped that this information may prove useful not only in making the daily job easier, but also safer. To compile this information, we have quoted freely from the following sources and we sincerely appreciate their assistance:

The National Safety Council.
American Standards Association.
American Ladder Institute.
Duo-Safety Ladder Corp.
HB Industries, Inc.
Rose Manufacturing Corp.

Limitations of Necessity

There is no contending with necessity, and we should be very tender how we censure those that submit to it. 'Tis one thing to be at liberty to do what we will, and another thing to be tied up to do what we must.—L'ESTRANGE.

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- Desk Set Boxes, Common Battery and Magneto, pages 5 & 6 Catalog #11
- 27C Hand Sets with new cords
- 15 and 53 generators
- 72-HA, 73-HB, 74-HC, 79 and 84 Ringers
- Condensers, any type
- Induction Coils, any type
- 41A Receivers with new cords

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S&G

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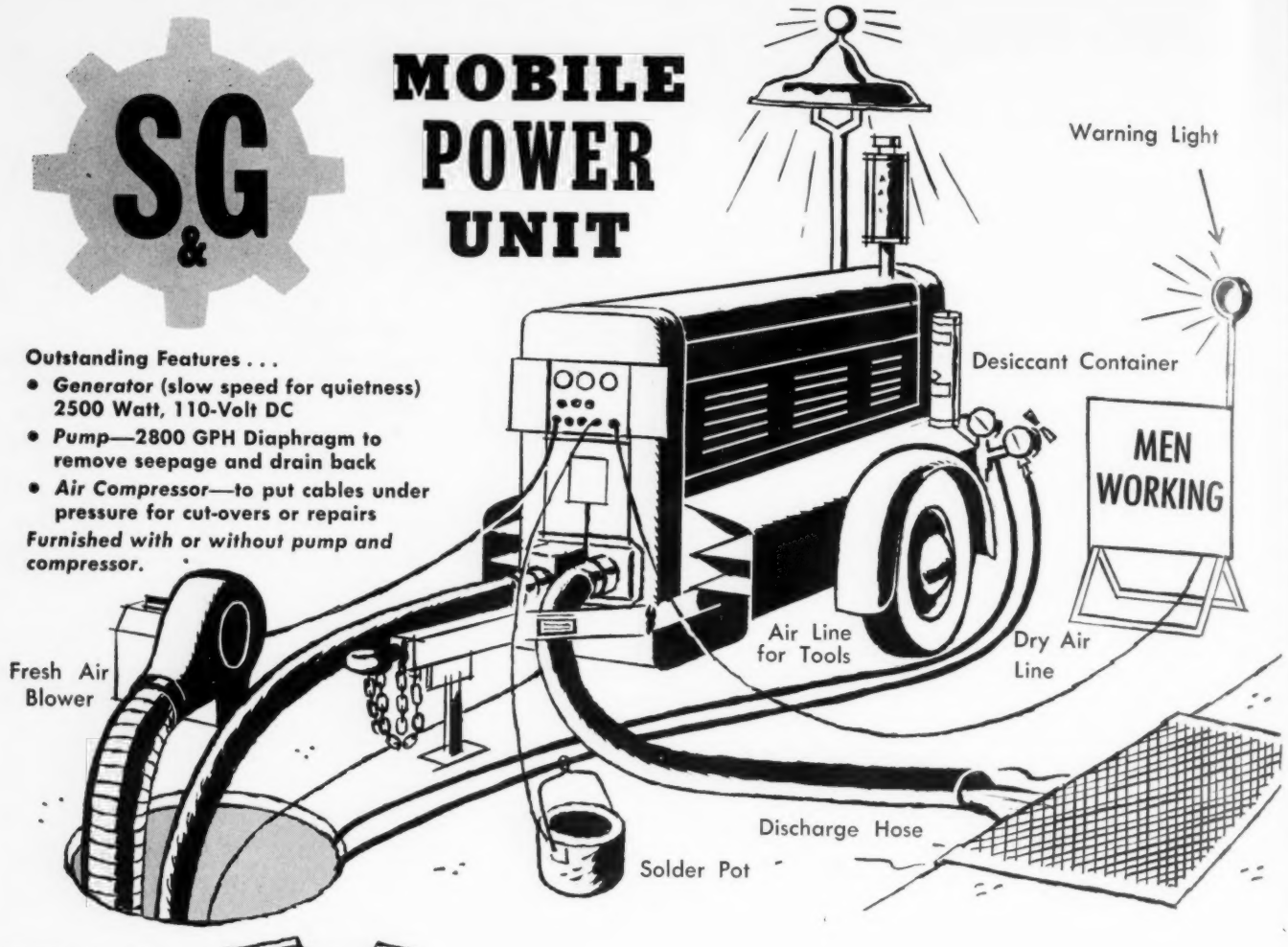

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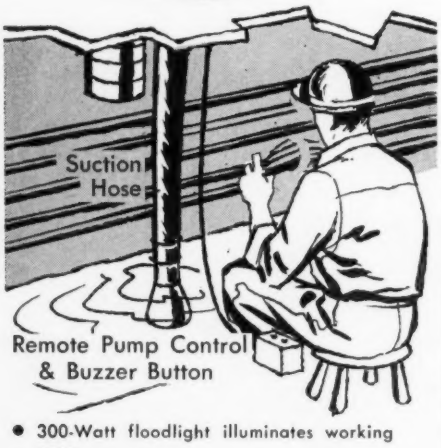
- ***Generator*** **(slow speed for quietness) 2500 Watt, 110-Volt DC**
- ***Pump*****—2800 GPH Diaphragm to remove seepage and drain back**
- ***Air Compressor*****—to put cables under pressure for cut-overs or repairs**

Furnished with or without pump and compressor.



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- diaphragm pump can be operated from manhole by push button control
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Sells Colored Telephones With Appliances in Cal.

Arrangements were made in August by Pacific Telephone & Telegraph Co. with Everybody's Furniture Mart, Eureka, Cal., to combine merchandising of Pacific T&T's colored telephones and Philco Corp. appliances.

As advertised in newspapers and in the furniture mart's window display, customers who bought Philco appliances at more than $175 received a colored telephone set to match. The installation charge is paid by the store.

Georgia Man Helps Publish Blue Ridge Tourist Folder

H. M. Stewart, president of the Standard Telephone Co., Cornelia, Ga., and a director and former president of the Georgia Telephone Association, recently took part in the publishing of a pamphlet promoting the sightseeing and vacation attractions of Georgia's Blue Ridge Mountain area.

Standard Telephone Co., which serves several of the towns in the Blue Ridge area, and the U. S. Forest Service, provided the illustrations for the folder. The Georgia Chamber of Commerce newspaper commented, "This is a fine example of local—and state—cooperation. A dozen north Georgia communities joined with the tourist department in publishing this folder."

A recent Georgia association member letter had this to say: "H. M. Stewart . . . (is) a leader in civic enterprises in his community. . . . A strong believer in institutional publicity, Mr. Stewart uses several kinds of publicity folders for distribution to his company's customers."

Pacific T&T Executive Made Public Relations Head

An added management assignment for Robert J. Hadden, Los Angeles, a vice president and director of Pacific Telephone & Telegraph Co., was announced by the company's president, Mark R. Sullivan, effective Aug. 29.

Mr. Hadden will head the company's public relations activities for the five Pacific Coast states and will retain his present responsibilities involving matters of general policy and organization.

IT&T Builds New Electronics Plant, First on West Coast

The International Telephone & Telegraph Corp. will construct a new plant in Los Angeles, Cal., for the further expansion of manufacturing of electronics equipment by one of its divisions, the Federal Telephone & Radio Co., according to William H. Harrison, IT&T president.

Representing an initial investment of over $600,000 for land, building, and equipment, the new plant will be constructed in five parts, at an ultimate cost of nearly 2½ million dollars.

A line of electronic products, including power supplies and other devices particularly useful in aircraft manufacture are to be produced at the new location.

This is IT&T's first factory on the West Coast and, according to Mr. Harrison, is a further indication of IT&T's rapid change from a public utility to one of the leading producers in the field of electronics, now the third largest manufacturing industry in this country."

A. B. Preble, With Stromberg 40 Years, Retires

Arthur B. Preble, manager of telephone sales, Kansas City office, Stromberg-Carlson Co., a division of General Dynamics Corp., retired on Sept. 1, following 40 years of continuous service with the company.

A. B. PREBLE

Mr. Preble has been a well-known and popular figure in the telephone industry for many years. His father and three uncles before him were also in the telephone business.

Mr. Preble started with the Phoenix Telephone Co., Steubenville, O., in 1905, where his father was manager of the company. Following experience with

T. S. Gary (center), president, Theodore Gary & Co., and board chairman, International Automatic Electric Corp., is shown inspecting a new demonstration unit of automatic toll ticketing equipment at Hasselt, Belgium, installed by Automatic Electrique S. A., Belgian manufacturing affiliate of Automatic Electric Co., Chicago. Hasselt is a principal office in the Belgian telephone network. From left to right: George Blackburn, managing director, Automatique Electrique; L. Liekens, chief engineer and director, Hasselt district, Belgian telephone administration; F. Stehlik, chief engineer, Automatique Electrique; Mr. Gary; L. Deroisy, in charge of government sales and installations, Automatique Electrique; M. Lambiotte, chief engineer, Belgian telephone administration projects; and J. N. Janssens, general manager, Automatique Electrique.

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Sizes may be assorted for quantity price.
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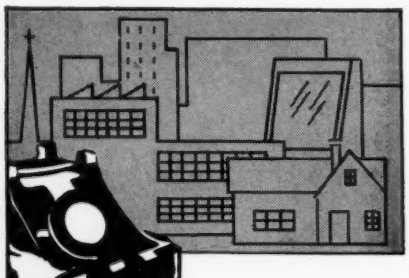

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the Ohio State Telephone Co. and the Garford Mfg. Co., he joined Stromberg-Carlson in 1916 as an installation foreman. In 1925 he became a member of the Kansas City telephone sales force and subsequently traveled as a sales representative in Missouri and Nebraska, the Rocky Mountain states and Kansas until 1940, when he was appointed sales engineer of the company's Kansas City telephone division. In 1945 he became manager of telephone sales, Kansas City office, a position he has held with Stromberg-Carlson until his retirement.

Mr. Preble is a member of the Theodore Gary Chapter, Independent Telephone Pioneer Association.

Arnold Joins Lenkurt's EF&I As Sales Engineer

B. L. Arnold has joined the sales division of Lenkurt Electric Co., San Carlos, Cal., the company has announced.

Mr. Arnold will be sales engineer for Lenkurt's new "Engineer, Furnish & Install" service which provides carrier or radio equipment on a completed project basis. In this capacity he will coordinate activities of the company's contract project engineering department with the Lenkurt distributor, Automatic Electric Sales Corp.

B. L. ARNOLD

Mr. Arnold has been associated with the Independent telephone industry since 1938. For the past five years he has been with Automatic Electric where, as a division manager in the carrier and radio sales group, he has been responsible for sale of Lenkurt carrier and microwave systems to Independents throughout the United States.

Before that he was affiliated 12 years with Independent operating companies in California. He was with General Telephone Co. of California at Santa Monica from 1938 to 1942, and with California Interstate Telephone Co., (formerly Interstate Telegraph Co.) at Bishop from 1942 to 1950.

A registered professional engineer in California, Mr. Arnold is a member of the Telephone Pioneers of America and the American Institute of Electrical Engineers.

McMullan Named Controller Of Exide Division

Morrison McMullan Jr., has been promoted to controller of Exide industrial division, The Electric Storage Battery Co., it is announced by Roland Whitehurst, vice president and general manager. Previously he was budget director of the division.

Joining Exide in 1947 as staff assistant to the vice president, Mr. McMullan has held posts as staff assistant and assistant to the executive vice president and manager of production planning.

MORRISON McMULLAN JR.

From 1941 to 1946 he served in the U. S. Navy as a cost inspector, rising from ensign to commander.

Mr. McMullan is an honor graduate of Wharton School of Finance and Commerce, University of Pennsylvania (1933). He became a certified public accountant in 1938, and is a member of the American Institute of Accountants.

Suttle Equipment Co. Opens Sales Offices in Chicago

Suttle Equipment Co., manufacturers and distributors of telephone equipment and supplies, have announced the opening of new manufacturing division sales offices in the Field Building, 135 S. La Salle St., Chicago, Ill.

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International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

Kennedy Saw Mills, Inc., Box 54, Shreveport, La.—Premium poles, Penta or Creosote. Quick shipments.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."

C. L. Lineberger, former engineering consultant and now sales manager for Suttle, has moved his divisional offices to the La Salle St. address from the company's Lawrenceville, Ill., plant. Suttle Equipment Co. is now in its 47th year of activity in supplying the telephone industry.

E. Seltzer Appointed to Engineering Post for Exide

Ervin Seltzer, former manufacturing services manager, Stokes Molded Products division of The Electric Storage Battery Co., Trenton, N. J., has been transferred to the headquarters of the company's Exide Industrial division in Philadelphia, and appointed manager of industrial engineering.

Oakley N. Dean, manufacturing manager of the division, stated in announcing the appointment, that Mr. Seltzer would have charge of industrial engineering for Exide plants in Boston, Chicago, Detroit, Philadelphia and San Francisco.

Mr. Seltzer was graduated from Yale University in 1930 with a bachelor of science degree in industrial engineering.

He holds three U. S. Patents and is a member of the Society for the Advancement of Management and American Society of Testing Engineers.

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